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Cigarette Paper Output Expands in Canada

Dallas Grant of Howard Smith Paper Co. Describes Work of Chemists To Utilize Flax Fiber To Replace European Linen Rags — Concern Started Investigation of Flax In 1942 — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 5, 1945—How papermakers in Canada have saved the situation for the tobacco trade in this country has been brought to public attention by news dispatches telling of relative scarcity of cigarettes in the United States, accompanied by pictures of long queues of would-be buyers forming outside tobacco stores in American cities. Here in Canada cigarettes are plentiful, despite the enormous quantities that are being exported to men on active service overseas. This is due not only to the fact that Canada grows her own tobacco, but even more to the fact that this country has a thriving industry in the manufacture of cigarette paper.

The story of the inception of this industry is told by Dallas Grant, of the Howard Smith Paper Company Limited, Montreal, who traces the success to utilization of waste flax straw from growers of flax seed on the western prairies. Formerly the Canadian and American markets depended on French paper makers for their supply of cigarette paper. About ten years ago Canadian and American cigarette makers, realizing the uncertainty of a European supply of cigarette papers in the event of hostilities, began to interest paper makers on this side of the Atlantic in the manufacture of cigarette paper. It was several years before the art was mastered, and then the difficulty was that the chief source of raw material was linen rags from Europe, for while some textile flax had always been grown in Eastern Canada and certain parts of the United States, the acreage had never been sufficient to create any real linen industry in North America.

Sought Fiber to Replace Imported Rags

The gathering of war clouds in Europe prompted pulp and paper research chemists to seek a home source of supplies of some fiber to replace European linen rags, should that market be shut off. The first step was the use of waste textile flax from the Quebec and Ontario flax processing plants. After a considerable amount of research it was found that this fiber could be treated so as to product a satisfactory paper making material. However, the acreage was so small that sufficient supplies could not be secured from this source.

The next step was to explore the possibility of using flax straw from grain flax, which is grown in large quantities in Western Canada for the production of linseed oil. While the straw from this flax contains a fair amount of fiber, it had never been of interest to textile manufacturers on account of its shortness. Research chemists soon proved that the shortness of this grain flax was no detriment to its use for paper making purposes. This opened up a tremendous new source of raw material which had previously been a waste product, for the practice of the western farmer had been to burn his stacks of flax straw as soon as it was threshed.

Investigation Started in 1942

It was in 1942 that the Howard Smith Paper Mills began an investigation of western flax straw, and as a consequence they set up a decorticating plant in Winnipeg which was brought into production early in 1943. The plant and storage space covers 15 acres. The fiber produced at this plant is baled and shipped to the company plant at Beauharnois, near Montreal, where it is cooked and bleached into pulp and is then ready for the actual paper making process. The Winnipeg plant uses about 12,000 tons of straw per year, which is purchased within a radius of 75 miles from Winnipeg. While only a small portion of available flax straw is now being used, there is every reason to believe that further research and improvement in manufacturing methods may permit a far greater portion of this waste material being profitably used. Already it has meant additional thousands of dollars in the pockets of western farmers, besides providing gainful employment for a large number of workers at the Beauharnois plant. The flax pulp mill at Beauharnois has one digester and one wet machine, with a capacity of 10,000 lbs., of flax pulp per 24 hours. Cigarette paper is only one of many varieties of fine papers which the company manufactures in its paper mill at the Beauharnois plant, the total capacity of which is 40,000 lbs. per 24 hours.

St. Regis Companies Changes Names

The corporate name of St. Regis Paper Company of Canada Limited has been changed to St. Regis Timber Company Limited, and the corporate name of Bates Valve Bag Company Limited, manufacturers of heavy-duty multiwall paper bags, has been changed to St. Regis Paper Company (Canada) Limited. All activities are now conducted under the new corporate names. The change of name involves no change of ownership, management or policies.

J. J. Levis Paper Co. Incorporates

BOSTON, Mass., March 5, 1945—The J. J. Levis Paper Company, 98 Cambridge street, Lawrence, Mass., has been incorporated with a capital stock of 80 common shares. Joseph L. Levis is president and treasurer; William L. Baxter, clerk, and Mary A. Levis the third incorporator.

Midwest Sees Less Paper in Second Quarter

Critical Pulpwood and Short Wood Pulp Supply Expected To Further Curtail Home Paper Supply — Hope For Early Shipment of Swedish Pulp — Waste Paper Salvage Gains — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 5, 1945—The Chicago paper trade expects the second quarter of 1945 to be worse than the first quarter as far as shortages are concerned. Pulpwood deliveries to mills are expected to be sharply reduced and the manpower and transportation difficulties of the first quarter are only figured to be accentuated as the year moves along. Shortages of chemicals provides another definite problem while extra demands for raw materials for use in rayon and munitions production are expected to have a depressing effect on supplies.

The industry still likes to find a grain of optimism in the thought that Swedish pulp can get back into circulation this spring although military reports indicate that there is still a real military job to be done before goods can move freely through Baltic ports.

Locally the waste paper situation was perhaps better than in other parts of the country because this area escaped much of the inclement weather that held up collections in other sections. Even so, and despite excellent salvage efforts, the situation remains critical in this territory. In other specific instances, books and covers seemed a bit less tight in supply than other lines, particularly board where the mills are said to be exceedingly hard hit. Sulphites, all grades, were far behind any semblance of a civilian schedule.

Waste Paper Salvage Gets Results

Chicago collection of waste paper in special drives has attained an average of 19,000 tons a month for the last fourteen months to give the city the lead over all other cities in the nation, according to J. R. Robinson, secretary of the waste paper salvage committee. The figure represents 19% of the total excess tonnage of waste paper collected each month throughout the United States. Adding the excess tonnage of collection to the 30,000 tons of waste paper collected through normal channels each month in Chicago and using four million as an estimated population, Chicago has a per capita average of 24½ pounds of waste paper collected monthly. Excess tonnage is figured on the basis of four sources of waste paper; industrial collections, which average 12,000 tons a month; schools, parochial and public, 4,000 tons; special events, 2,000 tons and excess office supplies 1,000 tons.

The United States as a whole collected 420,000 tons of waste paper each month through regular channels in normal times. That figure has now been increased to 587,000 tons. Newspaper campaigns to spur the paper collections is credited for about 60% of the increase of 100,200 tons a month excess tonnage for the country as a whole. Mr. Robinson pointed out that until the last few months when a decrease was experienced while collections in schools were being organized, Chicago was collecting about 21% of the national excess tonnage.

Scouts Begin Salvage Campaign

Boy Scouts in Chicago and surrounding area began this week to work out a two months campaign to collect 15,000 tons, or 10% of the national Scout quota. The war service directorate of the Chicago Scouts said that the total would be 1,000 pounds for each scout and those who attain the goal and troops having a 100 per cent record will receive special awards. Meanwhile, the combined bands of one of the schools just celebrated the end of a four day drive by crowning one of their fellow students the band paper queen. This drive was an individual school effort worked out for after school hours.

Reports on Sapeye Meeting

F. D. "Pat" Patterson, sales executive of the Flambeau Paper Company, and recently reelected vice president of the western division, Salesmen's Association of the Paper Industry, gave a full report of the recent annual meeting of the SAPEYES at the regular Monday session of February 26 held at the Hotel Sherman. "Pat" reported on all the business at hand, announced the election of S. O. Styles of Martine Cantine Company as national president and of Edward J. Edwards, Howard Paper Company, Chicago, as assistant vice president of the western division. He also reported on the various committee recommendations and reviewed the February 19 sessions along with some interesting highlights of SAPEYE conduct at various entertainment spots. Mr. Patterson reported that he had been unable to complete a list of committee appointments for the ensuing year and announced that present committee chairmen and personnel would hold over until a later date. He also announced that at least ten western division members were present during the meetings, seven of them at the annual session of the SAPEYES and that approximately twenty-five Chicago paper trade leaders representing various local associations were present at the war-time conference.

Celebrate 50th Year

One of the oldest and most well known paper distributors in the midwest, the Empire Paper Company of Chicago, began this week to observe its fiftieth anniversary. The company was established in 1895 and is one of the oldest concerns of its kind in this area.

Newspapers Protest Further Newsprint Cut

Members of the Inland Daily Press Association, with offices in Chicago, have, through their board of directors, unanimously approved a resolution opposed to any further cut in the manufacture of newsprint. Copies of the resolution were sent to all interested War Production Board officials. The five point resolution stressed the importance of keeping a high selling medium available for post-war employment and that further reduction in newsprint manufacture would not aid in meeting the shortage of materials existing in other segments of the industry. The Association warned that newspapers have had to reduce the number of their printed pages with every degree of restrictions in newsprint supply, being unable to downgrade paper to gain additional pages despite the restrictions.

Consolidated Co. Adds Employee Facilities

Housing Shortage For Farmers and Farm Helpers Employed In Winter Solved By Renovation of Old Commercial Hotel—Flow In Wisconsin River Is Increased — NLB Orders Mill Election.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 5, 1945 — To provide quarters for employees who live too far away from Wisconsin Rapids, Wis., to return to their homes, the Consolidated Water Power and Paper Company is renovating the old Commercial hotel. A crew from the construction department of the company is putting the building in order. Only necessary repairs and replacements are being made. The building has been unoccupied for some time. The kitchen will not be used, as no meals will be served in the building.

Consolidated is now employing a considerable number of farmers and farm helpers who will return to farm work early in the spring. Since this will reduce the working force, it has been necessary to recruit workers from greater distances. Private homes have made rooms available to workers, but a shortage has developed, making renovation of the hotel necessary. No estimate has been made as to the number of employees who will be able to find room in the hotel building, acquired recently by the company.

One hundred and twenty-five foremen from Ahdawagam Paper Products Company and Consolidated Water Power and Paper Company received certificates signifying completion of course in personnel relations training at a banquet at the Wisconsin Rapids, Wis., Elks Club Wednesday evening, February 28.

The course was conducted by Charles Pagnucco, representing the Wisconsin Department of Vocational and Adult Education. Those who presented the certificates to their respective foremen were Frank Walsh, manager of Ahdawagam; C. E. Jackson, manager of the Wisconsin Rapids division of Consolidated, and Warren Meadle, manager of the Biron, Wis., division.

M. S. King, the featured speaker, gave facts concerning the rights and responsibilities of automobile drivers, explaining fine legal points and dspelling some of the erroneous deas which some persons have in respect to the recovery of highway damages.

Flowing in Wisconsin River Increased

The Wisconsin river stream flowage has been increased during the last few weeks. On Monday, February 26, it was 1,998 cubic feet per second at Merrill, Wis., compared to an average of 1,682 during the previous week, and an average of 1,593 cubic feet during the previous seven days.

Heavy run-off into the reservoirs of the Wisconsin Valley Improvement Company, which has its offices at Wausau, Wis., have kept the reservoirs up to an average of 8.49 per cent of their capacity, when it had been planned to reduce the water reserves still further. Additional water was being released from the reservoirs in ordr to cut down stored water in preparation for the spring breakup.

Labor Board Orders Mill Election

An election among employees of the Bergstrom Paper Company, Neenah, Wis., to determine a bargaining agent has been ordered by the National Labor Relations board, it was announced last week. The election was requested by the International Brotherhood of Paper Makers, AFL.

Schwarz Opens Branch at South Bend

Schwarz Paper Company, Chicago distributors and mill agents, has opened a branch house in South Bend, Ind., under the management of Alfred C. Gall, formerly vice-president of the Central Ohio Paper Company and general manager at Toledo.

This announcement follows closely a recent statement by Sidney L. Schwarz, president, in which he said, "Larger merchants are developing chains of branch houses. By increasing their buying power and widening their distribution facilities, they enhance their value to manufacturers. And by expanding their scope of servce they enhance their value to consumers."

Schwarz Paper Company has held a prominent position in the Mid-Western market for the past 35 years. The South Bend branch, while it will be within this major marketing area, may be expected to expand the territory now being covered.

Plans for Port Alberni Mill Progress

Further progress towards the establishment of a sulphite mill at Port Alberni, B. C. by Bloedel, Stewart and Welch Ltd. has now been taken. The Port Alberni City Council passed the first reading of the bylaw, authorizing a fixed taxation agreement for a period of 20 years.

Bylaw and agreement now go to Victoria for ratification by the legislature through a government bill.

Council took the action after further conferences of legal representatives of both sides in Vancouver.

Referred Only to Industrial Div.

BOSTON, Mass., March 5, 1945 — The recent announcement by Sherman Paper Products, Newton Upper Falls, Mass., that Juels E. Timer had been made Eastern sales manager, and Allyn G. Whitehead, Western sales manager, referred only to the Industrial Division of this company.

In the Specialties Division, which sells pan liners and packaging products to the bakng industry, the Eastern Division is headed by John E. Sheehan, with headquarters in New York, and Arthur Proudfoot, Western sales manager, with headquarters in Chicago.

To Hold Ladies Night May 5

Officers of the Michigan Division of the American Pulp and Paper Mill Superintendents Association held a special meeting Tuesday, February 27, and set the date Saturday evening of May 5 for the Annual Ladies' Night Dinner Dance, to be held at the Park American Hotel, Kalamazoo.

Details of the meeting will be announced at a later date.

Obituary

Nathan Sanford Clark

Nathan Sanford Clark, well known in the paper trade in which he had many friends, passed away February 26 at his home, 86 Hyde avenue, Newton, Mass., in his 67th year. Mr. Clark was for a number of years with the W. H. Claflin concern. In 1919, with Carleton Knight and George D. Allen, he organized the firm of Knight, Allen & Clark. Later Mr. Knight died and Mr. Allen withdrew from the company. This company carried on business in fine papers at Fort Hill Square until 1936, when they removed to 295 Congress street, and later to 275 Congress street. In 1941, the Century Paper Company, Inc., took over the company, Mr. Clark continuing until last November, but had not been active since then. Mr. Clark was a member of the Boston Paper Trade Association. In former years he served as an alderman in the city of Boston.

A wife, Mrs. Elsie E. Clark, a daughter, Mrs. Winifred Peterson, and a son, Sanford Clark, of Newton, who is in the U. S. Army in Germany, are living.

Funeral services were held at the Rich & Bellinger Chapel, Newton, March 1.

Ray S. Pierce

Ray S. Pierce, aged 63 years, general manager of the Newhouse Paper Company of Des Moines, and vice president of the Newhouse organization died February 23. He was the son of James M. Pierce, former publisher of the *Iowa Homestead*. He was vice president and treasurer of the James M. Pierce Corporation, of Des Moines, publishers of the *Wallace's Farmer* and the *Iowa Homestead*. Mr. Pierce was associated with the Newhouse Paper Company for the past twenty-five years. Survivors are his widow; one daughter, Mrs. Ted H. Little of Des Moines; one son, James M. Pierce, of St. Louis, Missouri; a sister, Mrs. Hugo Schnabel; a brother, Dante M. Pierce, all of Des Moines; and four grandchildren.

Frank E. Holbrook

Frank E. Holbrook, former mill manager of the Oxford Miami Paper Company, West Carrollton, Ohio, a subsidiary of the Oxford Paper Company, Rumford, Maine, died in Dayton, Ohio, on February 27, at the age of 68. Mr. Holbrook had been engaged in the paper-making industry for forty-five years at the time he retired, in July, 1942. During the almost half-century of activity in the trade, he became one of the well known figures in paper industry manufacturing, taking an active part in trade organizations and general activity for the benefit of the paper industry.

Mr. Holbrook entered the paper business with the Kimberly Clark Corporation, in Appleton, Wis., when a very young man. In 1900 he went to the Great Northern Paper Company as superintendent of their mill at Millinocket, Maine, a mill which at that time was the largest newsprint mill in the world. Later he joined the International Paper Company as assistant manager of manufacturing.

In 1921, he joined the Combined Locks Paper Company of Appleton, Wis., as general manager of manufacturing. He joined the Oxford Paper Company family in 1929 when he was made mill manager of the Oxford Miami Paper Company in West Carrollton, a position which he held until his retirement.

Mr. Holbrook was born in Neenah, Wis. He is survived by his wife and three children: John V. Holbrook, Mary E. Holbrook, and Mrs. James D. Platt.

H. C. Friel Made Vice President

Harold C. Friel has been elected as vice president in Charge of Operations of the Wood Flong Corporation. The announcement was made in New York by Nelson Maynard, who has been president of the corporation since the death of Jackson Townsend.

Coming to the Wood Flong Corporation as traffic manager when the concern located here 16 years ago, Mr. Friel has steadily advanced in the organization. He was successively promoted to assistant superintendent, superintendent and mill manager and now becomes the active head of the corporation's operations.

Since the death of President Jackson Townsend, Mr. Friel has been in charge of manufacturing and has worked out many plans for improving both the company's product and working efficiency of the mill. Much new equipment has been installed and much more is on order, which will have to wait for postwar deliveries.

A significant feature of the statement is that which says that the corporation has formulated plans for expansion and for the handling of new products, all of which will be done in Hoosick Falls mill.

Since taking up his residence in this village Mr. Friel has interested himself in many community affairs and has contributed in a substantial way to the success of many community enterprises. He is a member of the Hoosick Falls Kiwanis Club and the Hoosick Falls Country Club, is chairman of the current campaign for funds for the boy scouts and has acted in a similar capacity for many other communitywide projects.

E. A. Russell Made Vice President

Edwin A. Russell, director and sales manager of the Philadelphia Quartz Company, manufacturers of silicates of soda, Philadelphia, has been named vice president in charge of sales. Mr. Russell joined the company in 1918, was appointed assistant sales manager in January 1921, and sales manager in January 1928. He now has full administration of the company's domestic sales. In addition, he is director and sales manager of an associated company, the American Doucil Company, manufacturers of synthetic zeolites.

J. Passmore Elkinton, vice president and director, continues in charge of foreign sales for the Quartz Company.

The company also announced the appointment of George J. Banse as assistant treasurer and assistant secretary.

Powell River to Build Clinic

Erection of a $15,000 medical clinic building is proposed for Powell River, B. C. The building will be erected in the pulp and paper town by the Powell River Company, and it is understood it will be built adjacent to the hospital built there a short time ago. The new building will provide office facilities for four doctors.

Hollingsworth & Whitney Co. Continues to Make History in New Field

The Hollingsworth & Whitney Company is among the pioneer paper concerns of this country. Its history was recently briefly reviewed in an interesting manner in connection with the ceremonies attending the award of the Army and Navy E to the Chickasaw Mills of the concern at Magazine Point, Ala.

Although Hollingsworth & Whitney Company is a newcomer in the rapidly growing industrial field of Alabama, it is one of the oldest paper-making concerns in the United States, says this historical review. For the background of its history one must go back nearly 150 years to the early 1800's.

As early as 1801 Mark Hollingsworth, father of one of the founders of the present company, operated a paper mill on the Neponset River below Mattapan, near Boston. His sons, Ellis A. and Lyman Hollingsworth, followed in their father's footsteps and each became expert in paper making and contributed important improvements and new methods to the industry.

Discovered Improved Process

Lyman Hollingsworth discovered an improved method for the manufacture of a strong paper by the utilization of waste rope in the manufacturing process. This improved process was mothered by necessity, for Mr. Hollingsworth, being faced with a shortage of stock after the panic of 1837, tried the experiment of cutting the bolt ropes off old sails lying in the mill yard and using this material in the manufacture of paper. The result was a manila paper of great strength and good quality. A patent for this discovery was granted to John M. and Lyman Hollingsworth in 1843.

The Hollingsworth & Whitney Company was established at Boston on April 5, 1862, when Ellis A. Hollingsworth and Leonard Whitney, Jr. formed a partnership for the manufacture of paper and paper bags. Whitney had been operating a paper mill and bag factory at Watertown and Ellis Hollingsworth a paper mill at South Braintree, Mass.

First Machine-Made Paper Bags

Leonard Whitney produced the first machine-made paper bags in America at Watertown in 1857, on a machine invented by one E. F. Rice of Clinton, Mass. The bags used in those days were made flat, much like an envelope and pasted together by hand. Hollingsworth & Whitney Company within the next decade had pioneered the first manufacture of the paper bags formed with a square bottom. This development of the forerunner of the modern "grocery bag" was effected through the purchase of the patent rights of an 1872 invention by Luther C. Crowell. An interesting story connected with this development illustrates some of the unusual incentives for invention. Crowell, when a lad, worked as cabin boy on a sailing ship and was scolded by his captain for not getting the sugar out of the corners of paper bags. Crowell found this censure was unwarranted because of the structure of the bag. In his spare time he pasted up a square bottom bag, and later invented the machinery to produce it.

Hollingsworth & Whitney, and subsequently their successors, continued the manufacture of paper bags for the grocery and allied trades,—along with their manufacture of various standard and specialty papers, —up until the year 1925, when the paper bag business was sold out to others.

Charles A. Dean became associated with the company in 1874 as sales manager. In 1876 a mill was purchased at Gardiner, Maine, which was to be the site of continuous operation from that date until 1939.

On April 1, 1882, following the death of both partners, the business was incorporated as Hollingsworth & Whitney Company, with Sumner Hollingsworth as the first president. In this year Charles A. Dean became vice-president and general manager. Under his management the growth of Hollingsworth & Whitney Company was outstanding. The tonnage of paper produced increased from 2,705 tons in 1882-1883 to 54,000 tons in 1911, the year of Mr. Dean's retirement, while in the same period the capital stock was increased from $500,000 to $5,000,000.

Winslow Plant Started in 1891

Construction was started on the company's large mills at Winslow, Maine, in 1891. Here were built paper and pulp mills. The capacity of this unit was increased under Mr. Dean's direction and that of his successors, W. E. Pratt and M. L. Madden, to a point where 300 tons of paper are produced per day on six paper machines, and the daily production of sulphite pulp is 190 tons. The bleach plant has a capacity of 50 tons per day. In 1908 a groundwood mill was built at Madison, Maine, with a capacity of 100 tons per day.

Hollingsworth & Whitney Company's history covers the years of greatest development in the science of paper making in the United States and this well-established firm has participated in this growth. Its early mills first used hemp stock for raw material, then successively linen and cotton rags, Manila rope, jute, and finally wood fiber, then the chemically cooked wood fiber—sulphite pulp, and in more recent years, sulphate pulp.

Operation Starts at Mobile

In their northern mills this company has long held a high reputation as paper makers in the manufacture of specialty papers for exacting industrial uses. It had developed to a large extent papers which necessitated the use of imported Scandinavian kraft pulp. It soon became evident that the demand for a strong high quality kraft pulp was large and growing. Meanwhile developments and improvement in the utilization of southern pine pulp convinced Hollingsworth & Whitney Company that they could produce these high quality specialty products in the South. Most of the earlier mills using southern pine had been designed to serve the demand for high production rather than quality markets. Following extensive study and research a satisfactory process was selected that assured the production of high quality papers from southern pine, and it was decided to locate a mill in Mobile.

After selection of the present site at Magazine Point, the Hollingsworth & Whitney Company pro-

ceeded to design and build mills embodying the latest technical developments in equipment for the production of high quality bleached and unbleached papers to meet the exacting specifications of industrial uses. The Chickasaw Mills include a pulp mill, pulp-drying machine, bleach plant, 184 inch Fourdrinier paper machine and 124 inch cylinder paper machine, and all necessary accessory equipment. The plant has a daily capacity of approximately 225 tons of sulphate pulp, both bleached and unbleached.

Development of Shell Container Paper

Because of its modern facilities and experience, the Hollingsworth & Whitney Company was called on soon after Pearl Harbor to produce many war purpose papers to exacting specifications. The manufacture of its civilian papers was drastically curtailed in order to take care of the war demands. To effect conservation of the critical metal formerly used in shipping containers, the use of paper and paper board became increasingly important. One of the problems presented to the organization by the Ordnance Department was that of designing a satisfactory paper container for shipping ammunition to the fronts without damage or loss. Paper containers tried for this purpose up until that time had been found unsuitable to withstand the abuse of shipment and handling. The Ordnance Department asked for a strong, moisture-resistant cylindrical protector. This called for the strongest paper possible.

C. A. Redden, chief engineer of the company, was assigned to this task. Aided by the company's pulp and paper experts he carried on experiments which led to the development of an ammunition container paper of strength characteristics greater than any previously produced from wood pulp. Tests of various combinations and constructions were conducted in the company laboratories and in collaboration with the Ordnance engineers and the U. S. Forest Products Laboratories to develop the required paper and the design of the actual container. Hollingsworth & Whitney Company engineers also assisted in the design of equipment for testing the ammunition containers.

It is of interest to note that this Mobile mill manufactured practically all of the high-test paper board required for the ammunition container program until November, 1944, as up until that time it is stated that no other mill was able to meet the high quality specifications. The ammunition container plants assert that the Chickasaw Mill has produced an extremely uniform product, is consistently meeting all specifications, has continually increased its production and has never failed to make deliveries in conformity with the increasing schedule of Ordnance requirements.

Maine Mills Plan Post-War Expansion

Four Maine paper and pulp companies alone will spend around $5,000,000 immediately after the war for modernization of plant and expansion of new products, it has been announced, according to the Boston News Bureau. Latest and largest of planned post-war expenditures will be by Oxford Paper, which set aside $2,176,000 for that purpose in its December 31, last, financial statement. S. D. Warren, Keyes Fibre and Eastern Corporation have already borrowed "new money" for post-war purposes in connection with 1944 refunding programs.

Beginning of their modernization programs will depend upon how soon the companies receive the green light from Washington.

Foresees Less Bag Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 7, 1945—There probably will be fewer paper grocery and variety bags, shipping sacks, wrapping papers, envelopes and certain converting papers available to the public in the second quarter of this year, members of the Kraft, Special Industrial and Sulphite Paper Industry Advisory Committees were told by War Production Board officials at a recent joint session, WPB reported today.

Shortages of domestic wood pulp for the second quarter, beginning April 1, require a curtailment in allocations to manufacturers of civilian kraft, special industrial and sulphite paper, WPB officials said.

Kraft pulp is now a critical material, most of it going into fiber shipping containers, which have to be strong and tough to withstand overseas shipment and continued rought handling with little storage protection, Benton R. Cancell, Acting Director of Forest Products Bureau stated. Most of our kraft is reserved for military uses, he added, indicating that shortly there may be no kraft for other purposes. Within the next quarter, kraft products must be placed under close control, as are the critical metals, he said.

While it is believed that bag and wrapping paper producers will have to take a cut in their pulp allocations for the second quarter, it is hoped that allocations to manufacturers of certain industrial papers and sanitary food container stock need not be reduced further, in view of the high essentiality of these products, WPB said.

WPB officials pointed out that the proposed curtailments of pulp were not final, but would be carefully considered before being put into effect in the second quarter. It was also stated that curtailments in other segments of the paper industry would be considered shortly by advisory committees representative of the manufacturers involved.

Sorg Pulp Co. to Expand

Extensive improvements and additions are likely to be made at the kraft mill of Sorg Pulp Company at Port Mellon, on Howe Sound, B. C. in the early future. The proposed expansion will principally affect the recovery plant, washing and screening facilities. Substantial increase in production will follow.

However, detailed plans in this connection have not yet been drafted, and the program is being held in abeyance in part by the difficulty in obtaining required equipment and materials.

In the meantime, however, several new installations are being made to increase efficiency at the Port Mellon plant. A bucket elevator of larger capacity for handling chips will be completed shortly and water supply is being improved with a new intake basin and screening facilities.

Another item is installation of a yard conveyor for pulpwood and fuel storage. This is being done partly with a view to making it possible to give a full run of jackpine pulpwood in the mill. The jackpine pulp will then be mixed with other pulp in the proper proportions.

Sorg Pulp Company has been using jackpine for several months with success. The company has a contract with the British Columbia Security Commission which administers Japanese work camps in the Cariboo, shipping the jackpine out by railroad to Squamish.

ANOTHER EXAMPLE OF

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BY

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Some Information About Paper Reported By U. S. Paper Exporters

The United States Paper Exporters Council, Inc., which is a non-profit association, composed of a majority of the more important American paper export merchants, established several years ago to foster and promote the best interests of the paper export trade has just sent out a pamphlet entitled "Some Information About Paper" which in part is as follows:

While the council has taken all possible steps to cooperate with the Government in order to assure adequate supplies, the war has tremendously complicated the normal conduct of business. The council believes that the importers of American-made paper in world markets are vitally interested in having information from a disinterested but authoritative source. It is the council's purpose to issue informative statements periodically. This first announcement will serve to clarify present problems to all who import American-made paper.

It is necessary, at the outset of a new year, to take a sober and realistic view of the paper market. Paper is a commodity which must be transformed from pulp and other raw materials to the finished product by a multiplicity of manufacturing processes. The manufacture of paper is subject to war-time restrictions of manpower and shortages of raw materials, just as are steel, automobiles, radios and thousands of other items.

Paper Situation Is Worse

At a recent meeting in New York, an official of the United States Government, in charge of the Paper Section of the Foreign Economic Administration, stated that the supply situation as regards paper is worse than it has ever been since the beginning of the war.

Another official of the United States Government, Chief of the Pulp and Paper Unit of the Bureau of Foreign and Domestic Commerce, recently stated that the shortage of paper for civilian use will become progressively tighter. He further stated that the production of paper for war uses must be increased to meet expanding needs, and in addition demands for paper from the liberated areas must be taken care of.

Several leading associations of paper manufacturers and merchants have gone on record to say that we are faced with a serious outlook, and that from present indications, there is little possibility of any substantial easing during the present year of the shortage of raw materials used in making paper.

Serious Shortage of Papers

These reports from most responsible sources mean that there is a serious shortage of paper. The United States, the world's largest producer of paper, finds it necessary for the first time in history to ration that portion of its production available for export to the consumers and importers of paper in other countries. It is not at all pleasing to be told that you cannot have all the paper you want, since before the war, paper was always in free supply.

The first obligation and duty of the American paper manufacturer is to promptly supply to his Government and to our Armed Forces, and to the forces of our Allies, all the paper and paper products necessary to the conduct of the war. There can be no objection to this on the part of any civilian consumer of paper, however urgent his needs may be.

Another obligation is that of supplying paper and paper products to the enemy-devastated areas now being liberated by our armies and those of our Allies. These areas are unable for various reasons to produce paper or to secure it elsewhere, and they urgently need supplies of paper to carry on their essential activities until they are able to produce for themselves or to secure paper from their normal suppliers.

When these needs, paramount to all others, are taken care of, then the balance of American paper production becomes available for our domestic civilian needs and for export to our friends in other countries.

Our paper mills, faced with critical shortages of manpower and raw materials, have utilized every known process to maintain an adequate production of paper, yet the simple truth is that there is not enough paper to take care of the demands of our rapidly expanding world markets.

Exports of Paper Under Strict Control

The Government of the United States has, therefore, found it necessary to place the export of paper under strict control, so that the minimum essential needs of all our foreign friends can be covered insofar as may be possible under stringent wartime conditions. Exports are controlled and have been controlled for some time past by means of export licenses. This form of control is fair to all concerned, and while tending to fairly distribute paper to all who need it, also exercises a strict supervision over price. American paper prices, during this time of shortage, have not shot up to unreasonable levels, as they did in the last war, and have been at all times prices which reflect fair values.

While paper is in extremely short supply, and while our production is not sufficient to supply our foreign friends with all the paper they believe they require, our Government, acting in conjunction with the reputable paper exporter, is bending every effort to see to it that our foreign customers' essential minimum requirements are met, insofar as humanly possible.

Should Order Only When Needed

The American paper export merchant asks that you only order what you actually need, to anticipate your requirements as far in advance as may be possible, and to authorize your suppliers to substitute qualities or even alter specifications, should they find it impossible to serve your exact requirements.

Certain amounts of paper are allocated quarterly for export to our foreign markets. This quantity of paper falls far short of demand, but is all that can be spared for foreign civilian consumption. Export licenses are issued against such quantities, and these licenses are granted in the most part to those export paper merchants who have served certain markets in large volume in the past. There will not be sufficient paper licensed in any one quarterly period to cover all orders placed in this country, hence there

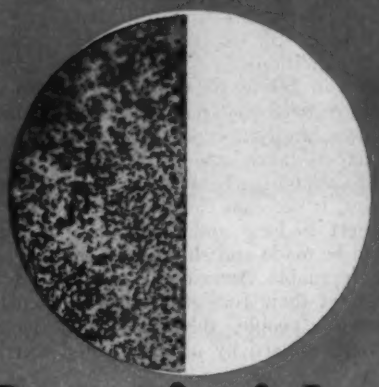
ONE OF 27 DOW CHEMICALS USED BY THE PAPER INDUSTRY

they quit painting with mold

Mold has a special appetite for paint. It likes practically all kinds, but its favorites are water soluble and emulsion types because of their high protein content.

When paint manufacturers presented their problem, Dow technicians gladly accepted the challenge. For they are probably the No. 1 enemy of mold, having fought it zealously for years. The "half and half" circle at the right proves how well Dow research men succeeded in combating mold in paint by mixing Dowicide in it during the manufacturing process. After 30 days' exposure in a humidity chamber, the Dowicide-treated portion remained free of mold. The untreated section on the left of the circle was dark with mold. Paint fortified with Dowicide resists mold even under conditions of dampness such as may prevail in breweries, canneries, dairies, textile and paper mills. The result is better light reflection, less loss from frequent renovations and shutdowns.

Today, there is a total of seventeen related Dowicide products. Each is designed for a special job but all are ready to help you with any mold problem that may exist under conditions special to your industry. Call on Dow to help you combat destructive, expensive mold attacks.



Dowicide

Germicides and fungicides

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle

March 8, 1945

will be, in most cases, long and unavoidable delays in securing export licenses, without which paper cannot be manufactured or exported.

No one can ignore the fact that the general quality and appearance of American-made paper has deteriorated. American-made paper before the present conflict was outstanding in quality. Our mills, however, have been forced to use inferior pulps and to substitute raw materials, simply because standard qualities are not available. Our Government now controls the distribution of all pulps, and mills must take what they can get to keep up production. Even so, the present qualities are not appreciably inferior to paper made ten or twelve years ago. All reputable paper export merchants will make every effort to ship usable paper. One thing is certain, and that is, with the ending of this war, American-made papers will again resume their outstanding quality.

Making of Certain Paper Prohibited

Our Government has found it necessary to prohibit the manufacture of paper in certain heavy weights, special colors, and unusual sizes and finishes. This action was not arbitrarily taken to deprive you of what you previously used, but is a logical effort to spread out the available amount of paper which can be produced.

Lack of suitable materials for properly packing paper for export shipment has forced mills to use substitutes. Lumber is needed urgently for other purposes, and many mills find it impossible to secure good quality cartons, rope, waterproof paper and metal fastenings. With all these shortages of essential materials, our mills are still making every effort to pack paper for export as safely as possible under existing conditions.

Delays in filling paper orders are inevitable. It must be realized that paper cannot be manufactured for export, until an export license is secured. When this delay is taken into consideration, together with the fact that mills are several months behind in their schedules, it becomes clear that orders for paper will be subject to long and disappointing delays before they can be made and shipped.

The reputable American paper export merchants believe that their foreign friends and customers are fair-minded people, tolerant of shortcomings and deficiencies caused by unprecedented wartime conditions.

The American paper export merchants promise that as soon as possible after the victorious termination of the war, American-made paper will again be available in unlimited quantities and outstanding qualities.

Opposes Cut in Newsprint

Senator Willis, Republican, of Indiana, in paying tribute last week to the contribution which newspapers are making in the war effort, told his colleagues in the Senate that there were rumors that newsprint allotments would be reduced in the second quarter of this year and that studies showed Government requirements are due to increase 1,250,000 pounds in that quarter. He added: "I do not intend to criticize here the various agencies of Government which deem it so necessary to carry on their propaganda as well as their essential needs during these war times, but I do contend that the Government is making a grave mistake if it restricts to a greater degree than it is willing to assume for itself, the use of paper for newspaper publishing."

Recommends Printing Paper Cut

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 7, 1945—Anticipating a reduction in the amount of printing paper that can be produced from the reduced pulp supply expected during the second calendar quarter of 1945, representatives of the magazine publishing industry and the commercial printing industry have recommended to the War Production Board that the shortage be met by a corresponding cut in the quantity of paper delivered to these two industries, WPB announced today.

At a joint session of the WPB industry advisory committees of these two groups this week, members were told of the impending shortage of pulp, and the consequent reduction of paper available to the printing and publishing industries in the second quarter. Confronted with the problem of curtailed supply, members of both committees, in separate sessions, proposed plans to limit deliveries of paper that publishers and printers may accept from available supplies.

Surveys conducted in the two industries indicate that a majority of magazine publishers and commercial printers have sufficient paper supply on hand to permit the required curtailment of their second quarter deliveries without a further reduction in their permitted usage. Publishers and printers with above-average inventories were reported as willing to accept additional curtailments in the amount of paper delivered and thus make available a larger supply for those less fortunate.

The task committee for both industries was authorized to continue studies of the problems arising from the shortage and to advise with WPB in working out procedures.

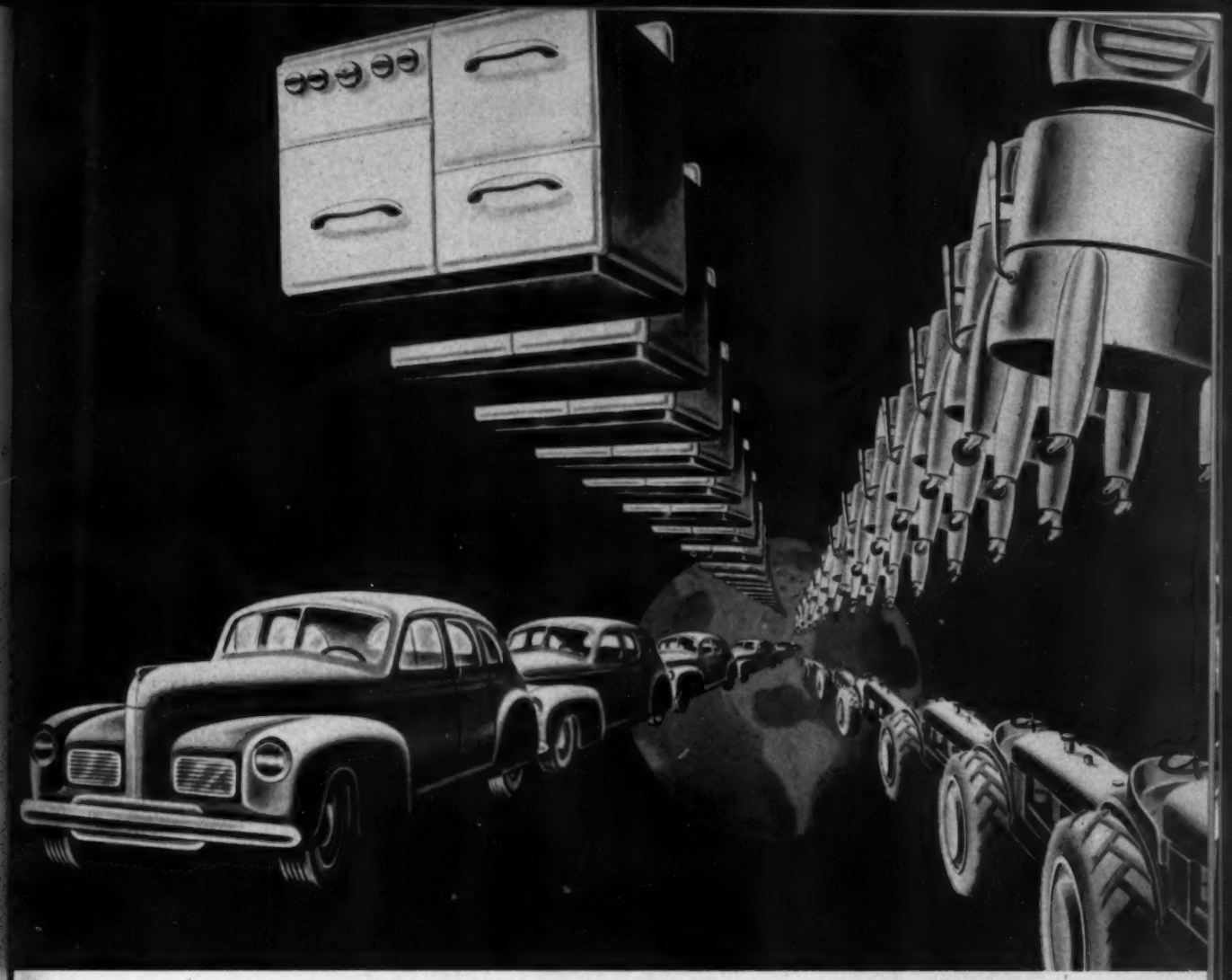
Specific problems affecting the two industries were discussed, and proposed amendment to orders were reviewed in the separate sessions of the two committees.

Heads Valve Manufacturers Group

W. B. Holton, Jr., president of the Walworth Company, manufacturers of valves and fittings, has been elected president of the Valve Manufacturers Association.

Since March 9, 1943, Mr. Holton has been production consultant and head of the Valve and Fittings Industry for the War Production Board in Washington as a Dollar-A-Year man. His resignation from this position became effective February 1. In a letter accepting Mr. Holton's resignation, H. G. Batcheller, chief of Industry Operations and vice chairman of the War Production Board, expressed to Mr. Holton the thanks and appreciation of the board for his "interest, resourcefulness, helpful guidance and competent advice in the handling of the many problems that have been ever present in the Valve and Fittings industries." Mr. Batcheller also urged Mr. Holton to accept an appointment as a member of the Advisory Committee in order that the board may continue to have the benefit of his advice on matters pertaining to these industries.

Mr. Holton is also Chairman of the Board of Trustees of the newly established Navy Industrial Association, an organization of several hundred industrial, railroad, and public utility corporations who have established the Association for the purpose of continuing, both now and post war, effective cooperation between private business and the Navy.



Something to do about tomorrow—TODAY

Your responsibility doesn't *stop* with maximum war production. As a business man, you are a vital unit in the U. S. plan for economic reconversion. Don't wait for the "V" day whistles to wake you up.

Post-war America must market annually 140 billion dollars worth of goods and services—over 50% more than in any pre-war year. But our enlarged production facilities that make this *necessary* also make it possible to capture *quickly* product hungry markets of the world—as well as tap our own accumulated needs and savings.

Here are the makings of those 55,000,000 peacetime jobs. Here is the guarantee against run-away deflation.

YOU MUST BE READY . . . (1) Make a reasonable estimate of your needs to begin post-war business. (2) Place orders *now* for this material, to be delivered as soon as W.P.B. permits. (3) Advise your customers to do the same. (4) Keep up-to-date on governmental rulings.

With all manufacturers doing this, the transition period will be shortened and depression trends stopped . . . *Because* this plan permits suppliers to anticipate *your* needs and begin production on them at an earlier date. It gives *you* a back-log of orders to start you off and assures your quick return to civilian business.

If you desire reprints of this advertisement without the Heppenstall name, mail your request to Heppenstall Co., Pittsburgh 1, Pennsylvania.

HEPPENSTALL, the most dependable name in chipper knives

SIGNAL CORPS PHOTO

Death for the Enemy —packed in PAPER

Out of its paper jacket—into the waiting barrel of a giant gun—then roaring on its way into the enemy lines. Up to the very moment of its mission of death, each shell is packed and protected in paper. Shell cases are made of paper board. Bullets and hand grenades are packed in paper cartons.

Today *paper* is a vitally essential war material—serving in countless ways at home, in industry and at the battle fronts. The paper industry, meeting the emergency with resourcefulness and skill, is making an enormous contribution to carrying the war to a victorious conclusion.

KENWOOD WOOL PRODUCTS

F. C. Huyck & Sons is proud to be serving an industry so essential to the war program. Our skill, our facilities and our 75 years of experience are always available in solving the special felt problems created by urgent wartime paper needs.

F. C. HUYCK & SONS

Kenwood Mills

Albany New York

TO COMPANY PRESIDENTS:

Here's Another BIG CHANCE FOR YOU to "Pass the Ammunition!"

Today—thanks largely to you and other industrial executives—22,000,000 civilian workers are speeding victory and achieving postwar security through the Payroll Savings Plan. Over 60% of the 6th War Loan subscriptions came from this source—and, between drives, this forward-looking plan has been responsible for 3 out of 4 War Bond sales!

Good as this record is, the Payroll Savings Plan can be still more effective. Believing this can best be accomplished by giving Bond buyers a definite idea of the many benefits accruing to them, the War Finance Division has prepared a variety of active aids for employee education.

This new "ammunition" includes:

a—An entertaining, swift-paced moving picture, graphically showing the importance of buying—and holding—War Bonds.

b—An interesting, easy-to-read booklet, explaining how War Bonds may be accumulated to provide education for children, homes, retirement incomes, etc.

c—Attractive, handy War Bond envelopes, enabling Bond holders to note each separate purchase—and the specific purpose for which each Bond or group of Bonds was bought.

Passing this particular ammunition requires that you reappraise your own company's Payroll Savings Plan. Have your own War Bond Chairman contact the local War Finance Committee—today! They will welcome the chance to discuss this new program with you.

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

★ *This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council* ★

Advises 5 Per Cent Newsprint Cut

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 7, 1945—The Newspaper Industry Advisory Committee has recommended that all newspaper publishers reduce their second quarter newsprint delivery orders by 5% in order to bring them into balance with supply, the War Production Board reported today.

Printing and Publishing Division officials, however, expressed fears that the reduction necessary might go deeper than 5% in view of transportation difficulties and increased Government requirements.

The committee further recommended that there be no cut in the present allowable consumption. This would require use of inventories to meet reduced deliveries.

The committee's recommendations were made in the face of an expected newsprint shortage of more than 45,000 tons, approximately 5¼% of estimated orders of 865,000 tons, WPB officials explained.

Increased newsprint requirements of the Armed Services and other Government agencies and shipments to United Nations, neutral countries and liberated areas contribute to the defincit, they pointed out.

The committee limited its recommendation of a 5% delivery curtailment to the second quarter only, because, members said, they believed adequate supplies of newsprint may be available during the second half of 1945. They also recommended that the fractional carload delivery provisions now in the newspaper order (L-240) should continue without change in order to prevent delivery delays and severe inventory reductions by small users.

Another recommendation was that the WPB Printing and Publishing Division establish a system of certification to break down the newsprint purchases of paper dealers and brokers according to the several limitation orders under which newsprint will be consumed. The proposed system would provide protection for a dealer's established newsprint customers, it was said.

The committee also recommended that proposed amendments to Supplement 1 to the Newspaper Limitation Order L-240 be adopted, in an effort to standardize procedure before the Appeals Board.

The amendments proposed include the following:

Determination of newspaper circulation increase in areas of extraordinary population growth by comparing the circulation in the first quarter of 1945 with the average for the year 1942;

Use of Census Bureau figures, when available, or public utility records of domestic customers of electric service, as basis for establishing growth in population;

Application of the adjustment factor, above the 7½% absorption requirements, only to that portion of a newspaper's adjusted base tonnage that corresponds to the ratio of its trading area net paid circulation to its total net paid circulation for the last two quarters of 1944;

Ex-quota paper grants made on appeals under the population-growth formula should not be subject to the sliding scale reduction;

Additional tonnage granted to provide circulation service due to increased population within a trading area should not be granted in succeeding quarters if the additional paper has not been used for that purpose.

Canadian authorities have advised the War Production Board that approximately 90,000 tons of newsprint are now backed up at Canadian mills and cannot be shipped because of lack of transportation facilities, printing and publishing officials reported. This has resulted in the shutting down of one Canadian mill and may shortly have repercussions on a number of other mills as well as on newsprint consumers in the United States, it was pointed out. The committee urged that newspaper publishers and representatives of other industries immediately make every possible effort to unload freight cars as speedily as possible.

After a two-day session, the committee adjourned to meet April 19-20, 1945.

Time Acquires Bryant Mill

KALAMAZOO, Mich., March 2, 1945—Time, Inc., of New York acquired ownership of the Bryant Paper Company local mills last week when stockholders of the latter firm voted unanimously to support the action of the board of directors taken February 17 approving the offer of the New York publishing concern.

Specifically, the stockholders voted to accept the $2,300,000 cash offer of *Time* for the real estate, machinery, equipment, inventories and the corporate name. The directors then convened and voted to change the name of the concern to the Portage Liquidating Company, which will assume charge of the remaining assets of the former Bryant Paper Company.

Tomorrow officers of The Bryant Paper Company will meet with D. W. Brumbaugh, secretary and controller of Time, Inc., and his attorneys for an organization meeting. At this time the Bryant Paper Company will be set up, with officers of the former Bryant Paper Company remaining in charge.

The transaction was made with the specific understanding that Time, Inc., will take only that part of Bryant's production which can be sold "without sacrificing any of the old company's present customer relationships," as it was put by Charles L. Stillman, treasurer of Time, Inc. This deal is the first one in the history of the paper industry in the Kalamazoo valley that a mill property has passed wholly into the hands of outside interests.

Mills State Allocation Preference

Manufacturers of tissue and sanitary papers would prefer an over-all percentage reduction of the amount of wood pulp allocated to their mills rather than curtailment of pulp for use in manufacturing certain types of these papers, the War Production Board was advised by members of its Tissue Paper Industry Advisory Committee at a meeting here last week, WPB has stated.

In view of the anticipated shortage of pulp next quarter, the WPB Paper Division called meetings of its advisory committees in the several segments of the industry, seeking advice as to how an equitable allocation of available pulp could be made.

In an effort to assure adequate tissue papers for essential military and industrial requirements, reductions in the amount of pulp allocated in the second quarter below those of the first quarter were suggested in what were considered the less essential fields, WPB officials reported.

Recommendations of the committee were noted by WPB paper officials, who said the whole question of pulp allocation to the various segments of the paper and paper board industry would be considered shortly and announcements made as to final allocations.

How Engineering has Licked *HEAVY DUTY* CLUTCH TROUBLES

If you operate heavy machinery, you know that your time losses and your maintenance expense are very likely to come from clutch trouble.

Modern engineering has come to your rescue with the Fawick Airflex Clutch, which controls power and torque by air, without arms, levers, toggles or springs.

Tug goes from full speed ahead to full reverse in 3 seconds

Here is proof in the toughest kind of service. On this powerful Diesel-driven tug, the Airflex Clutch was thrown from full speed ahead to full reverse in 3 seconds, without damage to engine or propulsion mechanism. No other type of clutch could possibly absorb torque in this manner.

Greater maneuverability for all Naval craft

Hundreds of Diesel-driven vessels in the Navy, Coast Guard and Merchant Marine have been equipped with Airflex Clutches. Without exception, these ships have greater maneuverability. Valuable space is saved, time is saved in installation and maintenance, and in the training of personnel, and performance has new reliability, especially under combat conditions.

Landing Craft made easier to handle

The landing craft of various types that are so essential in modern warfare are being equipped with Fawick Airflex Clutches to give them more flexibility of operation, and greater dependability under extreme circumstances.

Space-saving is a definite plus

Because the Airflex Clutch has no toggles, levers or springs, it saves, through its compact design, a tremendous amount of space over other types. This is especially important on marine installations, and wherever heavy-duty drives must be put into restricted places, such as cranes, hoists and draglines.

How the Fawick Airflex Clutch Works

Inflate the rubber-and-fabric gland and it expands to engage the clutch. Deflate and the clutch is disengaged. As simple as that is the way the Fawick Airflex Clutch controls power by air, without springs or levers or toggles.

Suitable for many important industrial applications

The Fawick Airflex Clutch has proved its efficiency and economy on steel mills, rubber mills, paper mills, hoists, shovels, cranes, draglines, dredges, presses, punches—all types of heavy duty machinery. Acts as clutch, brake, slip-clutch, flexible coupling or power take-off.

Engineering service

The Fawick Engineering Department will gladly consult with you on clutches for all kinds of heavy duty drives. Booklet on request.

• • •

FAWICK AIRFLEX COMPANY, INC.

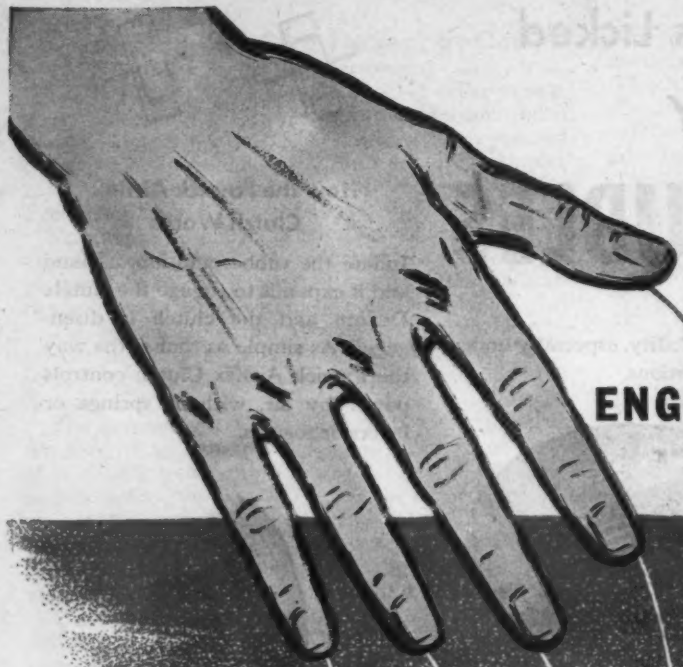
9919 Clinton Rd. • Cleveland 11, O.

In Canada, Ronald-Coventry Ltd., Montreal, Toronto, Vancouver

In Britain, Crofts Engineers, Ltd., Bradford, England

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR



AT YOUR

ENGINEERED ANSWERS TO

For maximum production . . . top efficiency . . . lowest operating cost, give your machines the finest in lubricants—Tycol oils and greases. Tycol lubricants are made to meet every lubrication need of industry — from roll neck greases for steel mills to spindle oils for textile plants. Each Tycol lubricant is scientifically engineered to meet specific service conditions. At every step from selection of crudes to blending of the finished product, Tycol lubricants are processed to provide maximum lubricating efficiency which means greater economy, longer machine life for every type of equipment.

Tide Water engineers are thoroughly experienced in all phases of industrial lubrication. They will be glad to assist you in selecting the Tycol lubricant best suited to your specific need. Call or write your nearest Tide Water Associated office for further details.

TIDE WATER ASSOCIATED OIL COMPANY

MAKERS OF THE FAMOUS VEEDOL MOTOR OIL • Eastern Division: 17 Battery Place, New York 4, N. Y.
Principal Branch Offices: Boston, Philadelphia, Pittsburgh, Charlotte, N. C.

Have You Received Your Copy of "Lubricania"?

This informative handbook, "Tide Water Associated Lubricania", gives clear, concise descriptions of the basic tests used to determine important lubricant properties — Viscosity, Pour Points, Neutralization Number and many others. For your free copy write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

DRUMS! DRUMS! DRUMS!

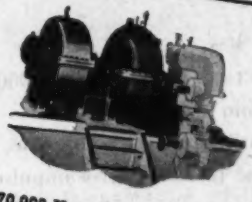
War needs make it extremely important that all empty drums be returned immediately

TYCOL

SCIENTIFICALLY

...Fingertips

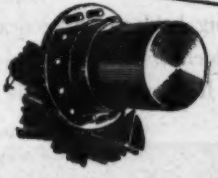
EVERY LUBRICATION NEED



"70,000 Hours continuous operation . . . neutralization only .09." That's typical of the unusual performance achieved with Tycol Turbine Oil. Thanks to Tide Water's Edeleanu process, this oil has greater stability and resistance to emulsification . . . assuring more economy, steadier operation, smoother performance.

"No more trouble with sticking valves . . . costly delays and overhauls eliminated . . . engines giving better service . . ." — that's how one plant engineer describes the improved results gained with Tide Water Diesel Oil. It assures maximum economy — top performance — from every gallon of lubricant.

"We saved 33⅓% in oil costs when we changed to Tide Water E. A. Cylinder Oil." That report from a plant engineer typifies the kind of economical, trouble-free lubrication provided by Tide Water Steam Cylinder Oil in hundreds of plants. It gives better protection, promotes efficient operation and lowers lubrication costs.



"Never a single bearing overheated since we changed to Tide Water Green Cast Grease," says one chief engineer. No matter how severe the service, Tide Water Green Cast Greases assure better lubrication . . . less maintenance. The reason? They contain more high-grade cylinder oil — less soap — which means better performance in every application.

"300,000 Spindles operating for 13 years without a single lost tube" — that's a textile mill operator's way of pointing out the superior performance of Tycol Spindle Oils. For every textile application — from power plant to finishing — there's a Tycol Lubricant scientifically engineered for the job.

INDUSTRIAL TYCOL OILS-GREASES

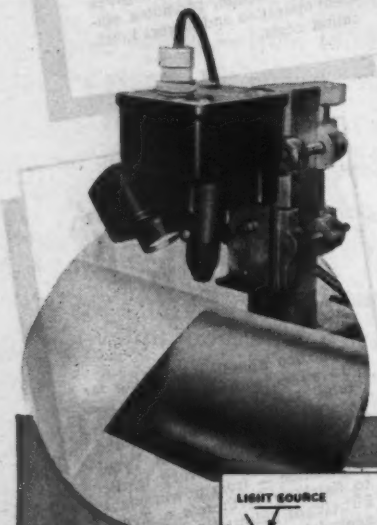
INDUSTRIAL LUBRICANTS

ENGINEERED FOR EVERY INDUSTRIAL USE

How HAIRLINE Control

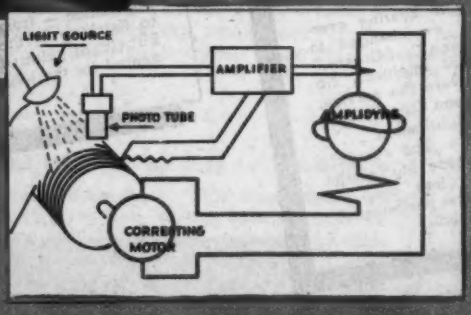
This G-E PARTNERSHIP MAKES IT PRACTICAL

The combination of electronic tubes and the G-E amplidyne (and often electronics alone) opens up many new possibilities in the precise control of paper travel over a wide range of speeds.



Already, successful installations are controlling side register and cut-off, regulating speed of supercalenders, and maintaining constant tension on rewinders as well as on sectional and single-motor paper machines. On bag machines, cut-off control at speeds of 400 to 500 ft per min is being held to an accuracy of 1/32 inch or better. Color register on high-speed presses is being held to 3/1000 inch at 1000-ft-per-min speeds!

With the G-E amplidyne, response to the control impulse is fast and positive. This generator-like unit steps up small control signals to working forces that can handle heavy machinery without appreciable time lag. By eliminating many contactors and relays, the amplidyne gives you a new concept of operating simplicity.



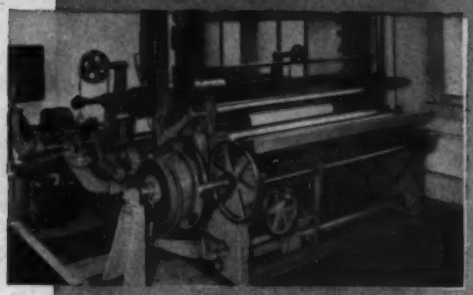
MAINTAINING SIDE REGISTER: Where accurate positioning is required, G-E photo-electric control equipment (left) scans the moving paper and detects variations in register by differences in reflected light. Electronically amplified, this control impulse acts through a G-E amplidyne to provide the corrective motive power. This is only one of the many ways in which these versatile units hold operations to the desired position, torque, or tension—regardless of speed.

GENERAL ELECTRIC

...of Paper Travel

FOR WINDERS, SLITTERS

Accurate side register control as paper travels at high speed is initiated by a photoelectric scanning head at the edge of the sheet (shown just below counterweight). An amplidyne powers the motor which corrects the roll position.



G-E side-register control on Cameron Machine Co. paper winder and slitter

FOR COLOR REGISTER

Here's extreme accuracy of register at high speed—a multicolor rotogravure press with paper speed of 1000 ft per min! A register mark made by the first impression is photoelectrically matched with a register slit on the next printing cylinder.

Installation at Nea Gravure Co., New York City.

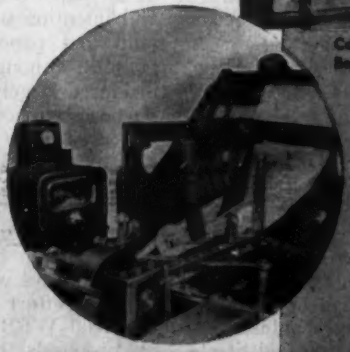
FOR BAG-MAKING MACHINES

Web-register control for precise cut-off begins with photoelectric scanning of register marks. An amplidyne-powered motor applies a differential correction between draw-roll speed and knife-roll speed.

Complete G-E bag-machine control a Bemis Bag Co., Peoria, Ill.

OR WHAT-HAVE-YOU?

Whenever paper in motion creates a control problem for you, you'll find G.E. ready with a practical solution, derived from wide experience on all kinds of paper-mill and printing-plant drives, as well as from electronic research. Let our application engineers give you the facts on the operating and maintenance experience of electronic controls now in regular use. You'll find convincing evidence of high operating continuity under difficult service conditions. *General Electric Co., Schenectady 5, N. Y.*



Installations at Arkell and Sm... Canajoharie, N. Y.

Buy all the BONDS you can—*and keep all you buy!*

To Be Central Division Manager

The Dicalite Company has appointed G. A. Russell as Central Division manager and H. L. Dunham as Eastern Division manager.

Mr. Russell, formerly manager of the company's district office in Kansas City, will make his headquarters in the Chicago office. He is a civil engineering graduate of Kansas State Agricultural College, and followed engineering and construction work for about 6 years. Since 1926, however, his work has

G. A. Russell

been sales engineering involving uses of diatomaceous silica. He has been a member of the Dicalite organization since 1931.

Mr. Dunham has been with the company for approximately 4 years, becoming district manager of the Cleveland office when it was established in 1941. He also received his engineering education at Kansas State Agrucultural College. His experience in industrial sales engineering, as well as civil and highway engineeiring, is extensive and includes connectons with Mundet Cork Company, Philip Carey Company, and the Government Park Service, previous to joining The Dicalite Company. Mr. Dunham takes up his new duties in the New York offices of the company.

R. O. Herbig Is Promoted

R. O. Herbig, since 1921 district sales manager in Chicago for the Reliance Electric and Engineering Company, Cleveland, has been appointed central western sales manager of the company, it is announced by Edward E. Helm, general sales manager.

The new position extends Mr. Herbig's activities to include the territory westward to Denver and is part of the company's program of enlarging responsibilities in line with expanded business.

Mr. Herbig came with Reliance in 1917 following his study of electrical engineering at Case School of Applied Science and has been with the company since except for a period of service in World War I. He opened the first Reliance office in Cincinnati in 1920 and became manager in the Chicago District in 1921, where he has been particularly active in application work in the steel, machine tool and paper industries. He is a member of the Association of Iron and Steel Engineers, Theta Tau Fraternity, Masonic Lodge and the South Shore Country Club.

Stein Hall Companies Merge

Stein, Hall & Co., Inc., New York, and its wholly-owned subsidiary, Stein, Hall Manufacturing Company, Chicago, are now being operated as a single company under the name of the former. Conducted substantially under the same management for many years, the two companies have been combined for the purpose of more efficient operation.

Stein-Hall manufactures and distributes starches, gums, dextrines and other materials used by many industries, and imports burlap and other commodities. The company dates back to 1866, when Solomon Stein launched a starch factory in Chicago. His son, Leo Stein, started the New York business in 1889. A year later he was joined by Frank Griswold Hall, who was president of the company when he died last July as a result of an automobile accident. Edwin Stein, son of the late Leo Stein, joined the company in 1916 and succeeded Mr. Hall as president.

Stein-Hall's home office continues at 285 Madison avenue, New York, and the Chicago office and factory continue at 2841 South Ashland avenue. To provide New York office space for reorganized and expanded industrial selling and product supply departments, the New York laboratory will be moved to Stein-Davies Company, Long Island City, N. Y., the company's gum and adhesive factory, where it is planned to centralize the company's laboratories. In addition to the present production control and food laboratories, there will be adhesive, paper, textile and starch research laboratories. Service laboratories will continue to be maintained at Chicago on food, adhesive and production control, and at Providence, R. I. and Charlotte, N. C., on textiles.

To Cut Book Paper Output

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 7, 1945—Estimates of available wood pulp indicate that printing paper production will have to be reduced beginning with the second calendar quarter, April 1, 1945, members of the Book, Groundwood and Writing Paper Manufacturing Industry Advisory Committees were advsied by War Production Board officials at a recent joint meeting here, WPB said today. This cut would fall largely on civilian usage, the officials said.

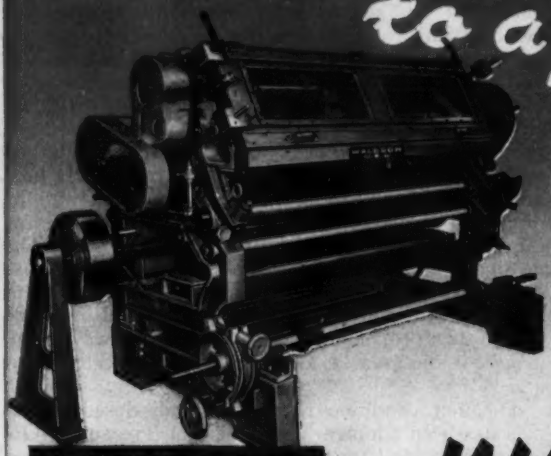
Any reduction in book paper production will be reflected in paper available to book and magazine publishers and to commercial printers, while a curtailment of fine paper will reduce supplies for commercial printing and business paper, WPB officials explained.

WPB said studies are being made in other segments of the paper manufacturing industry. It is the desire and intention of WPB to spread out any necessary pulp and paper cuts as equitably and evenly as possible, although production and use of some papers produced largely for military and essential industrial purposes cannot be curtailed at this time, WPB officials said. The present pulp and paper shortage was said by officials to have reached a very critical stage, largely as a result of lack of adequate pulpwood and shortages of manpower, especially in the woods, augmented by delays in transportation and by weather conditions.

Inventories were said to be extremely low.

In an effort to conserve pulp and paper supplies a special WPB committee was reported as working on proposals to amend WPB's paper simplification and standardization Order L-120, and industry members were urged to make recommendations to that end.

What's 1/10,000 of an inch to a paper maker?



Waldron Horizontal Reverse Roll Coating Machine

IT'S ENOUGH TO JUSTIFY HIS PREFERENCE FOR

WALDRON COATERS

Among Prominent Users of Waldron Coaters are:

American Coated Paper Corp.
American Coating Mills
Appleton Coated Paper Co.
Champion Coated Paper Co.
Consolidated Paper Co.
Hampden Glazed Paper Co.
Holyoke Card & Paper Co.
Martin Cantine Co.
Nashua Gummed & Coated Paper Co.
National Folding Box Co.
Standard Coated Products Co.
And Many Others.

Coatings metered to one-ten-thousandths of an inch can be secured only with rolls ground as fine as those provided in the Waldron Coating Machines. It is not surprising that experienced paper makers use more Waldron Coaters than any other make. They know what it takes to assure that solid, smooth uniform quality of coating that Waldron Coaters consistently produce. Made in Knife, Combination Roll and Knife, Roll and Reverse Roll types. Full particulars will be sent on request.

WATCH . . . for the new Waldron Micro-Jet Coater (patents pending) soon to be announced . . . a major advance that will speed up production of coated paper. *When there's better coating it will be done on Waldron Machines.*

Ruling Machines
Printing Machines
Combining Machines
Creping Machines
Floor Covering Machines
Gumming Machines
Rubber Mill Machines
Wall Paper Printing
Waxing Machines
Winders and Slitters
Special Design Machines

JOHN WALDRON CORPORATION
Main Office & Works — NEW BRUNSWICK, N. J.

WALDRON
Paper Converting Machinery

Delaware TAPPI Discusses Bleaching

The regular monthly meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry was held at the Engineer's Club in Philadelphia, Friday evening, March 2nd, with A. M. L. Bixler presiding. T. W. Toovey of Pennsylvania Salt Mfg. Company acted as program chairman for the evening, and introduced the subject of pulp bleaching by giving a brief history of the bleaching process as applied to the textile industry and then as adapted to the pulp industry. Developments in this process during the past few years are radically different from the previously used methods. Multistage bleaching has enabled the pulp manufacturer to retain a larger proportion of the initial strength of the cellulose fibers and still attain a higher degree of brightness at less cost. The trend seems to point toward tailor-made adaptations of the bleaching process to obtain the best pulp for specialized uses.

George P. Vincent of Mathieson Alkali Corporation discussed several bleaching processes with sodium chlorite which have post-war possibilities. M. V. Phelps of Solvay Process Company discussed the various methods and possibilities for kraft bleaching. He sketched the main variables to be encountered and ways of adapting the process to meet specialized needs. Open discussion followed.

Those attending the meeting were: Edward J. Albert, Frederick E. Aubel, III, Arnold J. Barea, Wm. L. Baummer, Dorothy A. Beiswinger, A. L. M. Bixler, E. R. Baublitz, George C. Borden Jr., Arch F. Bowers, F. W. Brainerd, S. G. Briscoe, W. J. Burke, L. K. Burnett, John Carson, John Cipriano, C. M. Connor, O. C. Cordes, Thage Dahlgren, Edward DeLauter, J. C. Dieffenderfer, W. P. Dohne, J. Edward Doyle, J. R. Dufford, Paul Easton, J. Edge, Fred Elliott, J. M. Farnum, H. J. Farrar, Jeanne H. Fisher, E. A. Georgi, E. N. Glauner, Philip H. Goldsmith, J. Good, Ralph E. Green, Samuel Hagner, Lois V. Hans, J. C. Harper Jr., Walter J. Higbie, C. W. Hoffman, H. F. Hoffmann, Harry Hulmes, J. Macadam, Wm. J. Marshall, G. B. Martin, D. Kenneth McCreedy, Raymond P. McGinley, E. P. McGinn, Louise E. McGrath, Alex. McInnes, Lewis B. Miller, I. Newman, L. Newman, J. A. Paciello, M. W. Phelps, R. K. Polak, R. W. Porter, Carl E. Price, William H. Purring, Homer F. Ray, C. H. Rice, J. Carl Schmidt, Mildred H. Simon, Oliver S. Sprout, Howard H. Street, John S. Syman, Richard N. Temple, T. W. Toovey, George P. Vincent, Ray Wilcox, G. C. Walton, A. E. Waugh, K. R. Watt, R. Wiggins, John P. Weidner, Jack Ward and A. H. Webber.

A Suggested Improvement

Users of Valley experimental beaters have reported difficulty with leakage through the diaphragms. This was traced to the softness and elasticity of the diaphragms, which caused the punched holes therein to spread and eventually tear out. Investigation of other diaphragm materials only resulted in less sensitivity of the diaphragm, but experiments with different types of diaphragm clamping rings led to the simplest possible modification of the former design.

The clamping surface of the diaphragm clamping ring is now knurled. This appears to have removed all the objections to the gum rubber diaprhagm. Users of these beaters need merely have the upper surface of the clamping rings knurled by a local machine shop or write to Valley Iron Works Company at Appleton.

Announces New Procurement Methods

The Office of Surplus Property of the Treasury's Procurement Division announced on March 3, 1945 its adoption of new procedures to be effective in the near future, to bring about uniformity in its Regional Offices throughout the country in the forms and methods used for competitive bidding. At the same time announcement was made of a new provision in Treasury's sales contracts permitting the Government to cancel any sale made to any bidder who acted on behalf of an undisclosed principal.

Under the new bidding procedure, which supplants "informal" bidding by letter, telephone, telegraph, or personal interview, prospective bidders who indicate an interest in surplus property which has been advertised for sale, will be furnished bid forms containing detailed descriptions of the property and advised of the day and hour when bids for such property are to be opened. Bidders will be entitled to be represented at the opening of their bids. Former practices of opening bids as received and of offering property without a definite closing time for the submission of bids are to be discontinued. The methods employed will closely approximate those used in competitive bidding for regular Government purchases but will be adapted to the special problems of surplus property disposal in such a way as to make for the greatest simplicity for prospective buyers.

The new condition relating to undisclosed principals has been adopted, it was said at Treasury's Office of Surplus Property, as a means of discouraging speculative transactions by persons falsely representing themselves to be agents for unnamed business houses.

Rules on Laundry Boxes

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 7, 1945—Manufacturers may use corrugated or solid fiber to produce laundry boxes or laundry shells for use by individuals for personal purposes, such as for overnight bags and carrying or shipping soiled clothes or similar articles, according to Interpretation 4 to Limitation Order L-317 (Fiber Shipping Containers) issued today by the War Production Board.

The interpretation was issued to dispose of pending appeals from manufacturers who sought to produce such laundry boxes for use chiefly by service men on furlough, the Container Division said.

Order L-317 continues, however, to prohibit a manufacturer from using solid fiber (.045 or heavier) or corrugated fiber to manufacture such boxes for use by commercial laundries, the Containers Division of WPB pointed out.

Packaged Steam Generators

The Clever-Brooks factory packaged steam generators were designed to meet industrial and commercial needs for a clean, compact, factory-assembled steam plant that could be installed and would operate at high efficiency with minimum attention and maintenance. These generators are available in 18 sizes, from 15 to 500 boiler horsepower (45 to 17,000 pounds steam per hour rated capacity). Standard pressures range from 15 to 200 psi.

The Clever-Brooks Company, 100 North 33rd street, Milwaukee 9, Wis., also manufactures heating units and mobile steam generators in 28 and 42 h.p. sizes, powered with air-cooled gasoline engines.

"Columbia makes our job easier . . ."

. . . says the Traffic Manager

Wartime transportation peaks have created many problems for manufacturers dependent on the steady flow of chemicals to their plants. Columbia's efficient Traffic Service has done much to minimize these problems for its customers, and to ease their traffic supervision tasks. That's why many a Traffic Manager is in full accord with his company's policy of favoring Columbia as its source of chemical supplies.

By their efficient handling of an unprecedented volume of traffic, the freight carriers have earned the thanks of the entire nation. They stress, however, the importance of the co-operation they have received from their customers. The job has indeed been so vast and so outstandingly successful that all Traffic men—both those employed by carriers and by their customers—can take pride in their contribution to America's war effort.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY • COLUMBIA CHEMICAL DIVISION

GRANT BUILDING, PITTSBURGH 19, PENNSYLVANIA

Chicago • Boston • St. Louis • Pittsburgh • New York • Cincinnati • Cleveland • Philadelphia • Minneapolis • Charlotte • Los Angeles

Would Aid Paper Industry

WASHINGTON, D. C., March 7, 1945—"When a supplier fails its best customer in an emergency, the customer should plan a more dependable source for the future," Representative Francis Case (R) S. Dakota declared today in introducing a far-reaching resolution on the critical newsprint situation.

"In the opinion of many close to the situation," Case continued, "Canada has not had any too cooperative an attitude in connection with the current shortage of all kinds of paper and paper products. I refer to the cutting of pulp supplies to our mills.

"Some of the fault may lie with our own negotiations with Canada in the present emergency. We may have been too easily satisfied with a bad bargain. But the Canadians seem to have been overly realistic in serving Canada's interests and if that is the attitude of our principal foreign supplier we shall be forced to be realistic, too, and plan for the future on such a basis.

"We have tremendous reservoirs of raw material for paper and paper products in Alaska, some sections of Northern states and generally throughout Southern states. We may be justified in encouraging greater development of our domestic paper manufacturing industry either with private or government capital."

The resolution follows:

WHEREAS, there has been during the past three years a serious shortage of paper and paper products; and

WHEREAS, the Department of Commerce has estimated that there will be a continuing shortage of paper and paper products even for a period after the close of the war; and

WHEREAS, The American war effort and American industry have been seriously handicapped by a shortage of paper for packaging and shipping; and

WHEREAS, the American publishing and printing industries have been unable to keep pace with the demand of the public for printed materials; and

WHEREAS, paper is a basic material with more than 700,000 uses in the war effort and plays an ever increasing part in our civilian economy; and

WHEREAS, there has been a consistent and progressive increase in the consumption of paper in the United States; and

WHEREAS, the United States is dependent on foreign imports for a large share of its paper and pulp supplies; and

WHEREAS, the war has revealed that foreign countries are not a secure and sufficient source of raw materials for paper:

THEREFORE BE IT RESOLVED, That the Committee on Interstate and Foreign Commerce is authorized and directed to conduct an investigation to determine the feasibility of aiding the development of the pulp and paper industry in the United States for the purpose of insuring adequate supplies of paper and paper products from domestic sources, such as the southern and northwestern areas of the United States and the Territory of Alaska. In conducting such investigation the committee shall give special attention to determining the availability of private and government credit for purposes of aiding such development, and shall request the cooperation of the Department of Commerce, the Department of Agriculture, and the Department of the Interior.

The committee shall report to the House (or to the Clerk of the House if the House is not in session) as soon as practicable, but not later than December 31, 1945, the results of its investigation, together with such recommendations at it deems advisable.

For the purpose of this resolution, the committee is authorized to sit and act during the present Congress at such times and places within the United States, whether the House is in session, has recessed, or has adjourned, to hold such hearings, to require the attendance of such witnesses and the production of such books, correspondence, memoranda, papers, and documents, by subpoena or otherwise, and to take such testimony, as it deems necessary. Subpoenas shall be issued over the signature of the chairman of the committee or any member designated by him, and may be served by any person designated by such chairman.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Marcel J. Bassalou, assistant chemist, Fraser Companies, Ltd., Edmundston, N. B., Canada, a 1937 graduate of the University of Montreal.

Miss Dorothy A. Beiswinger, Chemist, W. C. Hamilton & Sons, Miquon, Pa., a 1937 graduate of the West Virginia Wesleyan College.

Harold C. Brill, Research Chemist, E. I. DuPont de Nemours & Co., Inc., Newport, Del., a 1935 graduate of Ohio State College.

L. Baxter Chamberlain, assistant superintendent, Container Corporation of America, Wabash, Ind., a 1940 graduate of the New York State College of Forestry.

John F. Corwin, chemical director, Casein Company of America, Division of the Bordon Company, Bainbridge, N. Y., a 1937 graduate of Yale University.

William L. Nelson, industrial fellow, Mellon Institute of Industrial Research, Pittsburgh, Pa., a 1926 graduate of the University of Pittsburgh.

David F. Smith, director of laboratories, Johnson & Johnson, New Brunswick, N. J., a 1922 graduate of the California Institute of Technology.

Miss Carola Trittin, research chemist, Container Corporation of America, Chicago, Ill., a 1926 graduate of Lawrence College.

Harold P. Vannah, director of Plant Research Department, California Central Fibre Corporation, Pisgah Forest, N. C., a 1912 graduate of Bowdoin College.

To Build Warehouse at Birmingham

BIRMINGHAM, Ala., March 5, 1945—R. E. Hartman, president of the Mobile Paper Mill Company, in a conference with Commissioner J. W. Morgan Friday, announced that he will immediately build a warehouse in Birmingham with modern presses to supply the Mobile paper mill with salvaged paper to aid the War Department and its affiliates in the war program.

This plant will be a permanent structure and will operate after the war because there is always a demand for salvaged paper for regular uses, Leon Gilbert, state representative of the mill, said.

Mr. Gilbert said the plant would be constructed at 1010 North 17th street. Two modern balers already have been purchased. Plans for the building are now being drawn by architects and priorities have been recommended.

Between 40 and 50 persons will be given regular employment when the plant goes into full operation.

PIPE HANGERS AND SUPPORTS

for *any* piping *anywhere*

For any piping installation, from a simple water pipe to a high pressure, high temperature steam line, there is a stock Grinnell Hanger.

Grinnell Hangers will save you valuable engineering time and assure:

Faster Installation

Easy Adjustment during and after pipe erection

Full Provision for thermal movement

Easy Maintenance

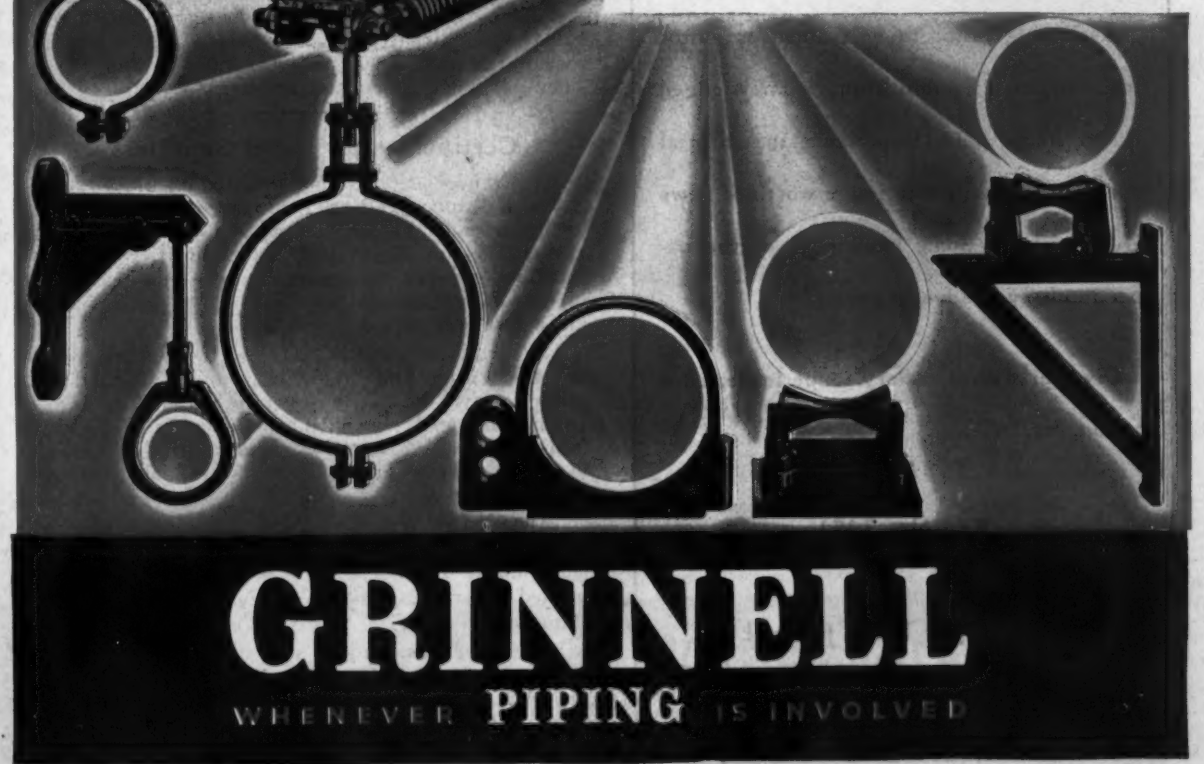
Compliance with all piping code requirements

Don't try to get by with makeshift or unreliable hangers – call on Grinnell for engineered hangers to meet your requirements exactly.

GRINNELL COMPANY, INC.
EXECUTIVE OFFICES, PROVIDENCE 1, R. I.

BRANCH WAREHOUSES

ATLANTA 2, GA.	LOS ANGELES 13, CAL.	PROVIDENCE 1, R. I.
CHARLOTTE 1, N. C.	MINNEAPOLIS 15, MINN.	ST. LOUIS 10, MO.
CHICAGO 9, ILL.	NEW YORK 17, N. Y.	ST. PAUL, MINN.
CLEVELAND 14, O.	OAKLAND 7, CAL.	SAN FRANCISCO 7, CAL.
HOUSTON 1, TEX.	PHILADELPHIA 34, PA.	SEATTLE 1, WASH.



GRINNELL

WHENEVER PIPING IS INVOLVED

Frank E. Jeffries Retires

Retirement from active business of Frank E. Jeffries, for 43 years head of the Tacoma division of Blake, Moffitt & Towne, formerly the Tacoma Paper and Stationery Company, was recently announced. His decision is based on a desire for more leisure and time to devote to personal affairs, according to O. W. Mielke, general manager of the organization.

Commenting further on the change, Mr. Mielke had this to say: "Frank Jeffries joined our company 43 years ago, coming from the John Leslie Paper Company of Minneapolis, the only other position he has held during his business career. When we established our Tacoma house in 1910, he was placed in charge and has remained its manager since that time. Under his direction, and because of his knowledge of the paper industry and his merchandising ability, our business was successful from the start. He and I have been associated together for many years and while I much regret that this association is terminating, I heartily concur with his reasons for desiring to withdraw from business activity."

In addition to the paper business, Mr. Jeffries has always interested himself in civic and business affairs of the community.

At the annual meeting of Blake, Moffitt & Towne, Inc. the following officers were elected: O. W. Mielke, president, Lyman V. Hall, vice president, and A. B. Coulter, secretary-treasurer.

The Tacoma division of Blake, Moffitt & Towne is one of 16 houses located in the states of Washington, Oregon, California, Idaho, and Arizona. Founded in San Francisco in 1855 and one of the pioneer wholesale institutions of the Pacific Coast, the organization is this year celebrating its 90th anniversary.

Assistant Editor to be trained as editor for industrial publication, acknowledged leader in its field. Experience in editorial make up and ability to judge worth of news are requisites. Some knowledge of the paper industry is advantageous.

Give all details, salary, experience, education, etc.

Box No. 7451

Care Paper Trade Journal

M-8

Rourke-Eno Make Promotions

William H. Rourke, president of the Rourke-Eno Paper Company, Hartford has announced the election of John W. Holt, Frank W. Holden and George L. Ray to the positions of vice-presidents of the company.

Mr. Holt, who came to the company in 1929, has been sales manager for the past ten years and lately has been active in the field of specialty and technical papers for war packaging and, as a result, will become increasingly active in the company's Coarse Paper Field. A graduate of Dartmouth College, he is a member of the fine paper merchants advisory committee to the O. P. A. and a director of the Sales Managers' Club of Hartford.

Mr. Holden came with the company upon graduation from Wesleyan University in 1928 and, as in the past, will continue to direct the Fine Paper Department. He is a member of the Connecticut State Purchasing Agents Association, the Hartford County Purchasing Agents Association, the Merchants Advisory Committees of both the Strathmore Paper Company and the Hammermill Paper Company, and is a past president of the Eagle-A Announcement Association.

Mr. Ray joined the company upon graduation from Deerfield Academy and has made an outstanding record in the sales field and as an expert in the packaging of war material for overseas shipment. He is also a director of the company, having been elected to the board in 1943.

The Rourke-Eno Paper Company was organized in 1847 as the E. Tucker Sons Company and has served paper users of Connecticut and the surrounding area continuously since that time. The company was one of the first in this area to stock waterproof and greaseproof papers meeting Government Specifications for overseas shipment of war equipment, and a considerable amount of total sales is at present going directly and indirectly into the war effort.

William H. Rourke is president and treasurer, Bulkeley VanSchaack is vice-president and assistant treasurer, Daniel L. Rourke is secretary, and Miss Lucy A. Kelley is assistant secretary.

Certificates for Paper Suppliers

A. E. Giegengack, Public Printer of the United States, has announced the inauguration of an award to be presented by the Government Printing Office to firms within the graphic arts industries and to suppliers of paper, equipment, and material in recognition of meritorious service to the Government during the war period.

The certificate, 14 inches wide by 18¼ inches deep, is set in Caslon Old Style roman and italics and is printed in two colors. It is stamped in gold to form a blue and gold medallion of Benjamin Franklin, bears the seal of the Government Printing Office in gold and carries the signature of the Public Printer under these words:

"Awarded in recognition and appreciation of the exceptional services performed for the United States Government Printing Office in the production of printed material essential to the Nation in the prosecution of the war."

Letters of nomination and inquiries regarding further particulars of the award should be addressed to the Deputy Public Printer, Chairman of the Awards Committee, Government Printing Office, Washington, D. C.

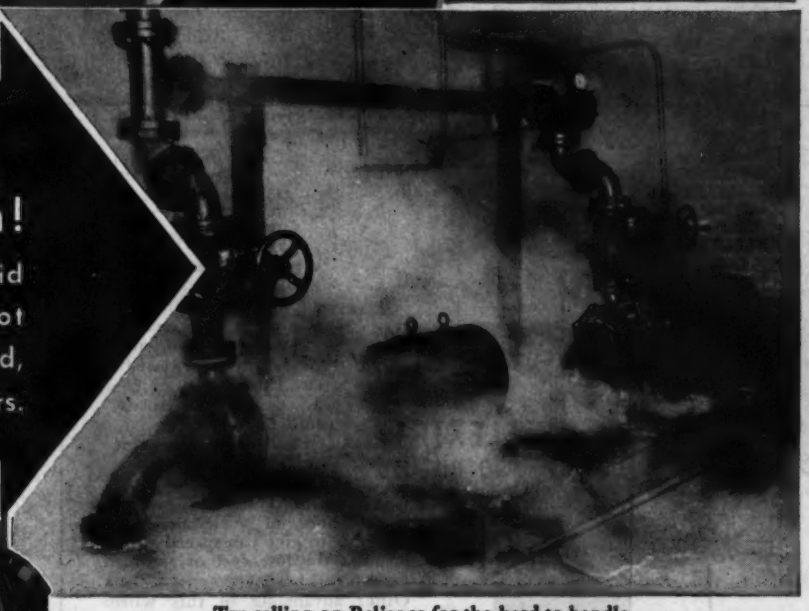
FOR TOUGH GOING—*TRUST RELIANCE MOTORS*

Dust and Dirt can't stop them!

• Thickly covered with dust *outside*, Reliance Motors in coke conveyor operation remain clean and cool *inside*.

Acid Fumes can't stop them!

• Fog from muriatic acid pickling tanks does not penetrate inside enclosed, fan-cooled Reliance Motors.



This type of enclosed, fan-cooled Reliance A-C Induction Motor gives dependable, low cost service.

Try calling on Reliance for the hard-to-handle assignments as well as the more usual ones.

RELIANCE ELECTRIC & ENGINEERING CO.

1099 Ivanhoe Road • Cleveland 10, Ohio

Birmingham • Boston • Buffalo • Chicago • Cincinnati • Detroit • Greenville (S. C.) • Houston Kalamazoo • Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Portland (Ore.) • St. Louis • San Francisco • Syracuse • Washington, D. C. and other principal cities.

RELIANCE A-C D-C MOTORS

"Motor-Drive is More than Power"

To Build Container Plant

Production of more than 6,000,000 artillery ammunition containers per month will be the goal of a new factory to be placed in operation for the government at Pine Bluff, Ark., by the Ammunition Container Corporation, subsidiary of the American Can Company, W. J. Wardell, vice president and comptroller, said today.

Mr. Wardell said the Pine Bluff location had been selected by the government because of its available supply of labor and its advantageous location with relation to arsenals in the Southwest, which are producing ammunition. The plant probably will be in production by June 1 and running at full capacity by October 1, he added.

The Pine Bluff plant capacity chiefly for 105 mm. and larger shell containers, is approximately 40 per cent greater than that of the other plant now operated by the company at Harvey, Ill. Starting operations in 1941, the latter plant has turned out approximately 180,000,000 containers for various size shells, he declared.

A building which is currently being used as a cotton storage warehouse, on an 11-acre tract adjacent to railroads, will form the nucleus of the new plant, according to Mr. Wardell. The building will be expanded to provide approximately 300,000 square feet of floor space. The plans call for an expenditure of approximately $2,000,000 in equipment, new construction and alterations on the present building, which is being acquired by the government.

With the exception of supervisors and key members of the staff for the operation of the plant, the entire personnel, which will be approximately 1,800, will be recruited in the Pine Bluff area.

Ten production lines will be installed and approximately 100,000 to 125,000 tons of paper a year will be required to fulfill the government schedule, he said. The cylindrical containers are made from ammunition container board, which is manufactured from mixed paper and used corrugated boxes, and "tube and can stock," which is made of all types of waste paper. To protect the ammunition from damage in transit and storage, Mr. Wardell said, the paper "suits of armor" must be tough enough that in routine government tests 30-pound and 50-pound shells are slid into their "armor" cases and dropped nose first to a concrete floor from an elevation of 10 feet.

THE use of worm gear speed reduction in Reading Electric Hoists allows you to fit the hoist to your plant layout subject to local conditions of clearance, space available, etc. These hoists are composed of four interchangeable units — suspension unit, hoisting unit, motor unit and control unit. Under this Reading Unit Construction Plan, 144 different combinations of these units are available to give you special equipment at the low cost of standard parts.

Other advantages of this worm gear construction are: quiet operation, compact size, and low cost of maintenance because of only three moving units in the hoisting mechanism.

It will pay you to investigate the money saving features of Reading Electric Hoists. For full technical information, write for Bulletin 1004.

READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS • OVERHEAD TRAVELING CRANES

READING HOISTS

Paper Scarcity Increases

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., March 5, 1945 —No improvement was seen last week in the civilian paper supply. In fact, it appeared the supplies were more restricted than they have been. Not only this, but from all indications, supplies for civilian use will be further restricted. Manufacturers' representatives say demand from government sources is increasing, which means, naturally, less for the civilian needs. Local jobbers are being hard put to it to apportion their available supplies among customers. In the back log of orders it is said that there are many which will not be filled at all.

The roofing and building paper situation is a trifle better. Stocks in local warehouses are fairly large and well balanced in comparison with other items in the paper list. It also is expected that demand will be a trifle better this spring than it has been since the government clamped down on new construction. Already the go sign has been given for a fair amount of small residential construction for spring in the critical defense areas of the state, of which this is one. Whether manpower can be obtained to secure this new construction is another matter.

Newsprint demand continued up to quota levels. New advertising is being turned away with monotonous regularity and even that of old customers is being curtailed. Book publishers of the state, one of the largest being in Indianapolis, are holding manuscripts for new publications until the times improve.

Box and container manufacturers see no improvement in production. Raw materials continue difficult to secure and the manpower situation has not improved.

Paper stock men here say mill demand is urgent and local supplies are entirely inadequate. Prices all were at ceiling levels. Also the demand for rags continued heavy with prices at ceiling.

Eire's Paper Industry

During the calendar year 1943, Eire's papermaking industry consumed 1,798 tons of wood pulp, 6,420 tons of straw, 929 tons of chemicals, and 7,943 tons of waste paper, according to a report received at the Department of Commerce.

Output of finished products during that year included writing paper in large sheets, 1,216 tons; bag papers, 2,217 tons; and packing and wrapping paper, 4,265 tons.

Source of "Firsts"

Modern Research Laboratory at Niagara Plant as interpreted by the artist, John Gaydos

THE FACT that Niagara was the first to produce several important electro-chemical products in this country is due in great part to the efficiency of its research. Niagara's research activities are under the supervision of men of long and thorough experience in electro-chemical development, manufacture, and usage. This has enabled Niagara to give valuable cooperation to many industries using such products in the processing of war materials. It will prove of equal value in helping these industries convert efficiently to peacetime manufacture. Look to Niagara for experienced chemical service.

Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK 17, N. Y.

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Future Depends on Forests

President Roosevelt, in a 300-word congratulatory letter addressed (February 1, 1945) to the Chief of the Forest Service, U. S. Department of Agriculture, on the occasion of the fortieth anniversary of the establishment of the Forest Service, said the economic future of America cannot be wholly safe until the future of the nation's forests are assured.

"Great tasks remain ahead in forestry." Mr. Roosevelt said. "To most of our forests, forestry is still unknown. By actual results in peace and in war, we have more recently seen the forest prove its value to the soldier and sailor at the front, the farmer and the city man at home, and to all our great lumbering and wood-using industries and the millions they employ.

"Before the economic future of America can be wholly safe, the future of our forests must be assured," the President said.

In commending the Forest Service, Mr. Roosevelt said, "You have a right to be proud—all of you, every member of the Service—for the Service has done great things. . . . It has made forestry known to America, it has turned many enemies of forestry into staunch friends, it has won the confidence and cooperation of the people, and it has led the way in making American forestry an outstanding achievement."

Chief Watts, after reading the President's letter, predicted that 40 years hence technical advances will have practically eliminated fire losses on the nation's forest lands and that public control of cutting and other forest practices on private lands will have been accepted as "an essential part of the American way to insure security for both the individual citizen and the Nation." He foresaw his successors 40 years from now looking back to 1945 with amusement over the present day fight for public regulation of forest practices.

"Even the lumber industry will recognize such control as a safeguard to private enterprise," Mr. Watts said. He warned, however, that figures today still show that timber is being cut and destroyed much faster than it is being replaced by growth. Among Mr. Watt's predictions for the future of forestry, was the description of timber as a recognized major farm crop in the eastern part of the nation; operation of many farm vehicles with alcohol made from wood instead of gasoline, a host of industries using wood for the production of varied paper, plastic and chemical products.

CINCINNATI
RUBBER COVERED
COUCH ROLLS

These Cincinnati rubber covered rolls are helping keep box board production up by giving trouble-free service with minimum regrinding. Special construction and manufacture gives . . . just the right cushion . . . just the right couching action.

Other Paper Mill Rolls Covered By "Cincinnati"

Suction Press Rolls	Press Rolls
Wormed Cutter Rolls	Coating Rolls
Wormed Felt Rolls	Top Rolls
Smoothing Rolls	Table Rolls

THE CINCINNATI RUBBER MFG. CO., CINCINNATI, O.

Woodpulp in Sweden

The woodpulp industry of Sweden is reported carrying sizable stocks and producers are keenly interested in resuming normal trade with the United States as soon as conditions are favorable, according to the Department of Commerce.

Reports of the purchase of Swedish woodpulp by the British Paper Controller for post-war delivery has created considerable interest in the trade.

The British purchase offer which was reportedly placed through private firms in England with individual mills in Sweden totalled about 275,000 metric tons of chemical woodpulp and 100,000 metric tons of mechanical woodpulp.

Stocks of chemical woodpulp in Sweden at the end of the third quarter of 1944 were estimated at about 600,000 metric tons. The industry expects to attain a monthly production of 200,000 metric tons as soon as market conditions permit resumption of full-scale activity.

Two mills recently resumed production after being closed for some time but there are still a number of mills which are closed for repairs and plant improvement.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending March 3, 1945

STOCKS

	High	Low	Last
A. P. W.	5¼	5	5
Armstrong Cork Co.	47	46	47
Celotex Corp.	17¼	16	17
Celotex Corp. pf.	20	19¾	19⅞
Certain-Teed Products Corp.	9¼	8¾	9
Certain-Teed Products Corp., pf.	153½	146½	151¾
Champion Paper & Fibre Co.	34¼	32½	32½
Champion Paper & Fibre Co., pf.	113¾	111¾	112
Congoleum Nairn Co.	28¾	27¾	28¼
Container Corp. of America	29¾	28	29¼
Continental-Diamond Fibre Co.	12¾	12	12
Crown-Zellerbach Co.	24	21⅞	23¼
Crown-Zellerbach Co., pf.	104⅞	104¾	104⅞
Dixie Cup Co.	20	19¼	19¾
Dixie Cup Co.—A	49	48¾	48⅞
Flintkote Co.	28⅜	27	27¼
Flintkote Co., pf.	...	...	...
Robert Gair	6¼	6⅛	6¼
Robert Gair, pf.	17⅞	17⅝	17⅞
International Paper Co.	25¾	23¼	24⅜
International Paper Co., pf.	91⅜	90½	91¼
Johns-Manville Corp.	112	110½	111
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	45½	45¼	45¼
Mac Andrews & Forbes	33	31⅜	32½
Mac Andrews & Forbes, pf.	...	...	...
Masonite Corp.	45¾	43¼	44½
Mead Corp.	14¾	14	14⅜
Mead Corp., pf. A—6%	100	100	100
Mead Corp., pf. B—5½%	99	95	99
National Container Corp.	14¼	13¾	13⅞
Paraffine Companies, Inc.	62	61	61½
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	19½	18	18¾
Rayonier, Inc., pf.	36½	35½	36
Ruberoid Co.	38	37	37¼
Scott Paper Co.	44	43	44
Scott Paper Co., pf.	109	109	109
Sutherland Paper Co.	34	33½	33½
Union Bag & Paper Corp.	16½	15⅝	15⅞
United Paperboard Co.	8	7⅜	7⅜
U. S. Gypsum Co.	86½	84	84
U. S. Gypsum Co., pf.	184	184	184
West Virginia Pulp & Paper Co.	26½	25¾	26
West Virginia Pulp & Paper Co., pf.	110½	110½	110½

BONDS

Abitibi Pulp & Paper Co. 5s '53	105	104½	104½
Celotex Corp. 3¾ '55	103½	103¾	103¾
Certain-Teed Products Corp. 5½s '48	103½	102	102
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	110	109½	109½
International Paper Co. 5s '47	104½	104	104
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending March 3, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	38¼	37⅜	37⅜
Hummel-Ross Fibre Corp.	8½	8	8½
St. Regis Paper Co.	6¾	6½	6½
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	6⅜	6¼	6¼

BONDS

American Writing Paper Co. 6s '61	102	101½	101½

Ruberoid Co. Profits Up

The Ruberoid Company for 1944 reports a net profit of $826,694, equal to $2.08 a share, against $812,519, or $2.04 a share, for 1943. Net sales increased 4.7% to $28,630,158 from $27,338,360 year before, Herbert Abraham, president, reported, voluntary retirement annuity plan proposed by management in December accepted by 83% of eligible employes.

Kimberly-Clark Issues Report

The annual report of the Kimberly-Clark Corporation, for the year ended on December 31, showed an increase in sales to $61,330,541 from the $57,488,294 volume the year before.

After all charges and taxes the net profit for 1944 amounted to $2,422,327, or $3.09 a share, on 599,760 common shares, against $2,399,636 or $3.69 each, on 488,173 common shares for the preceding year.

Fraser Companies Report

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 5, 1945—The annual report of Fraser Companies Ltd., of Edmundston, N. B., for the year ended December 31, 1944, shows that net consolidated profit for the year reached a new high record, and, exclusive of the refundable portion of excess profits, taxes, amounted to $1,457,751, equal to $3.93 per share on 371,016 common shares outstanding. This compares with adjusted net profit of $706,679 or $1.90 per share in the previous year. Including the refundable portion of taxes net was equal to $4.63 per share against $2.47.

Income and excess profits taxes in 1944 amounted to $2,590,000 including refundable portion of $259,000, compared with $2,558,500 in 1943 when refundable portion was $210,725.

Dividends on the common stock were resumed during the year and three quarterly payments of 35 cents each were made, requiring an amount of $389,567. Subsequent to the end of the year the quarterly rate was increased to 50 cents a share.

The report shows a reduction of $1,943,000 in funded debt as well as a new high record in working capital which reached $5,691,434 compared with $5,678,777.

Main factor in the improvement in 1944 earnings, the report states, was the first advance in pulp prices since July, 1940. Total pulp and paper tonnage was approximately the same as in the previous two years, but production of paper was proportionately decreased by diversion of pulp normally consumed by the company's Madawaska paper mills to other consumers by direction of the United States War Production Board.

Gair Co. to Redeem Notes

George E. Dyke, President, announces that the directors of the Robert Gair Company, Inc., at a meeting held on March 1, 1945, voted to redeem, on April 1, 1945, at 105 and unpaid interest, all of the outstanding $3,305,300 6% income notes of the Company due 1972. Checks for the 6% interest recently declared payable April 1, 1945 will be mailed on March 31, 1945 to all holders of income notes of record on that date, whether the notes are redeemed or exchanged under the plan of recapitalization announced on February 21, 1945. Under this plan, noteholders have the right, on or before the close of business on March 26, 1945, to present their income notes to Manufacturers Trust Company, 55 Broad street, New York 15, N. Y., for exchange under the plan, in which case, when the plan becomes effective and subject to allotment, an income note holder will be entitled to receive five shares of preferred stock (aggregating $100 par value) and five shares of common stock for each $100 principal amount of Income Notes deposited under the plan.

Rolland Co. Issues Report

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 5, 1945—The annual report of the Rolland Paper Company Limited, just issued, announces that the company has arranged for the refunding of its mortgage bonds as of April 1 next.

The amount of funded debt at the end of 1944 was $1,900,000, made up of $150,000 serial 4's due November 1, 1945-46, and $1,750,000 of 4½s due Nov. 1, 1951.

The refunding will be effected through the issue and sale of $1,900,000 new first mortgage serial bonds, comprising $1,350,000 maturing in annual instalments of $75,000 in each of the years 1947 to 1964 inclusive and bearing interest at rates varying from 2% to 4% according to dates of maturity, and $550,000 of 4% bonds due April 1, 1965.

"This financing will result in a substantial saving in annual interest charges," the report states.

The financial statement reveals an anticipated decrease in profits for the year ended December 31, 1944. Operating profit, including other income, was $554,851 against $663,190 in 1943. Net profit after depreciation, bond interest, and taxes, was $135,256 against $152,898.

Mr. Rolland states the reduction in earnings in 1944 is largely the result of increased labor and manufacturing costs, which were anticipated in last year's report. The company, he adds, "also suffered by a strike during the year, but your directors are pleased to report that relations with our employes at the present time are satisfactory."

Flintkote Co. Earns $1.38

With net sales of its building materials and other products of $37,280,966 the highest on record, comparing with $30,998,161 for 1943, the Flintkote Company reports a net profit of $1,477,394 for 1944, equal to $1.38 a share on the common stock, comparing with $1,250,276, or $1.51 a share on fewer shares outstanding in 1943.

A. W. P. Corp. Profits Off

The American Writing Paper Corporation for 1944 reports a net profit of $184,312, or 51 cents each on 360,224 common shares, against $244,966, or 65 cents each on 375,200 common shares for 1943. Report states that the corporation in December, 1944, sold the Beebe & Holbrook properties. The sales resulted in a net loss of $374,474 which has been charged to earned surplus. For some time, officers and directors have been giving earnest consideration to refinancing the present issue of general mortgage bonds, in the hope that the burden of interest charges can be reduced, the company states.

Scott Co. Nets $1.96

The Scott Paper Company and subsidiaries for 1944 reports net profit, after $1,406,000 taxes, was $1,566,220, equal to $1.96 a common share, against 1943 net of $1,534,926, or $1.91 a common share after $1,157,300 taxes. Net sales for 1944, including those to Government, were $31,467,002, an increase of 3% over 1943, Thomas B. McCabe, president, reported.

Crown Zellerbach Earns Less

The Crown Zellerbach Corporation and subsidiaries for the nine months to January 31, reports a net profit of $5,399,620, or $1.51 a common share, compared with $5,656,174, or $1.62 a share, for similar period of previous year.

Schumacher Corp. Earns 97 Cents

The Schumacher Wall Board Corporation for the nine months to January 31, reports a net income of $105,727, or 97 cents a common share, against $111,539, or $1.04 a common share, for corresponding period of previous year.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

EMPIRE STATE SECTION. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

CHICAGO PROFESSIONAL PAPER GROUP—Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

WOOD PULP SUPPLY

The wood pulp supply this year is dependent upon the receipts of pulpwood to a larger extent than formerly to meet increasing needs. Pulpwood receipts, totaling 16,469,000 cords in 1944, of which 14,819,000 cords were of domestic, and 1,650,000 cords of imported origin, were kept at a high level by the many pulpwood campaigns sponsored by the Government and by the paper industry. The growing demand for nitrating pulps, paper and paper board by the armed forces, the Department of Commerce states in its latest industry report, placed emphasis upon the urgent need of keeping pulpwood receipts at a high level, and the placing of logging and pulpwood cutting operations on the production urgency list for a large part of the year, helped immeasurably in stemming the movement of woods workers to other war supporting activities. That the 14,000,000 cord goal for domestic pulpwood was surpassed by over 800,000 cords is concrete evidence of the efforts of industry and Government to explore all channels, utilize all available means and to put into effect this vital commodity flowing to pulp mills as evenly as conditions would permit.

In commenting on the 1945 supply prospect for wood pulp, the Department states that the continued decline in pulpwood receipts and the general precarious wood inventory position at many mills, especially in the South, has caused a loss in production of much needed kraft pulp. In addition, wood pulp shipments from Canada will be 100,000 tons less during 1945, thereby reducing about 8,350 tons monthly from available supply. Recent severe weather impeded the movement of pulp to consumer mills making the transit time longer, and resulting in insufficient deliveries. In view of these existing conditions, the Forest Products Bureau of the War Production Board, in January, notified every paper and paper board mill to curtail its use of market pulp during the first quarter of 1945, by 5% below the consumption originally authorized. It was felt that a uniform reduction was the most equitable means of meeting this shortage of market pulp below original allocations. The amount of market pulp involved was about 10,550 tons, with 16,309 tons withheld from paper and 4,245 tons withheld from paper board allocations. The reduction applies only to market pulp, and direct military programs have been safeguarded. As integrated operations are not affected, beyond existing withholding provisions, the net effect on the over-all paper and paper board program for the first quarter it is believed will be inconsequential. The 5% saving of market pulp consumption, will, however, permit the industry to enter the second quarter with a slightly more favorable inventory position and thus cushion whatever adjustments may be unavoidable in the pulp, paper, and paper board program for that period.

Although pulp allocations for the second quarter have not yet been announced, it is likely that the 5% cut in the original allocations authorized in the first quarter will be continued. The 5% reduced authorized minimum allocations for paper and paper board totaled 2,661,297 tons, of which paper represented 1,683,796 tons and paper board 977,500 tons. Pulp for the manufacture of coarse papers was allocated the largest amount, 472,577 tons; book and groundwood printing papers, 373,741 tons; sanitary papers, 200,499 tons; fine papers, 189,177 tons; newsprint, 188,306 tons, etc. Wood pulp allocations for container board totaled 610,162 tons, building board, 191,474 tons; folding box board, 126,882 tons, etc. The Department explains that the 5% cut in market pulp authorized January 23, 1945, will not necessarily mean a proportionate cut in paper production, as very few, if any, grades of paper are of 100% wood pulp content, and therefore the net effect on the over-all paper and paper board program for the first quarter will be very slight.

At the annual meeting of the members of the Association of Pulp Consumers, Inc., held in New York on February 20, 1945, the policy of exporting wood pulp from the United States to liberated countries was discussed. It was the consensus of those attending that the carefully screened, approved needs of the liberated countries should be filled with paper and paper board which had been processed in the United States, rather than with wood pulp to be processed abroad.

During the discussion, it was pointed out that the shortage of paper-making wood pulp on the North American continent made it very difficult to keep all mills operating and that if any appreciable tonnage were exported, it would be necessary to close paper and paper board mills in the United States. The following resolution was unanimously adopted:

"Whereas, the Foreign Economic Administration has recommended that wood pulp be shipped from the United States to liberated countries, and it is recognized that any further depletion of the available

wood pulp supply would shut down paper and paperboard mills in the United States, be it resolved, that the Association of Pulp Consumers, Inc., recommend that the carefully screened, approved needs of the liberated countries be filled with paper and paperboard rather than with wood pulp, and further, that the Association of Pulp Consumers, support the position taken by Congreeman Lyle H. Boren, and recommend that, as soon as available, the necessary supplies of paper and paper products be furnished to the liberated countries from their normal sources of supply which are chiefly the Northern European countries."

Extra Paper Granted to Magazines

Extra-quota paper grants made to magazine publishers by the War Production Board Appeals Board during the period February 12 to 17, 1945, amounted to 46.13 tons, the Magazine and Periodical Section of WPB's Printing and Publishing Division said recently. During the same period applications denied totaled 151.5 tons.

The grants took the form of permanent adjustments to the base periods of the publishers, and are effective as of January 1, 1945. They are subject to any further curtailments that may be made as Order L-244 is amended from time to time.

To Speak on Post-War Paper Machine

The next meeting of the Michigan Division of American Pulp and Paper Mill Superintendents Association will be held on Thursday, March 15 at the Park-American Hotel in Kalamazoo. Dinner will be served at 6:30 P.M.

H. C. Moore, vice president of the Beloit Iron Works, Beloit, Wis., will speak on "Planning the Post-War Paper Machine."

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Jan. 20	87.1	Jan. 22	86.1
Jan. 27	88.4	Jan. 29	89.1
Feb. 3	88.8	Feb. 5	88.4
Feb. 10	90.1	Feb. 12	88.8
Feb. 17	91.0	Feb. 19	89.2
Feb. 24	89.7	Feb. 26	87.7

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	90.1	92.5	90.6	82.4	88.1
1945	*86.7*												

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	65.8	78.1	87.8	87.4	104.2	88.0	88.6	*87.8*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

* Based on tonnage reported to American Paper and Pulp Assn. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
Jan. 20	94	Jan. 22	93
Jan. 27	95	Jan. 29	95
Feb. 3	92	Feb. 5	97
Feb. 10	93	Feb. 12	97
Feb. 17	93	Feb. 19	96
Feb. 24	97	Feb. 26	93

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	*91*												

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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Are You Using Hooker Chlorine for Slime Control?

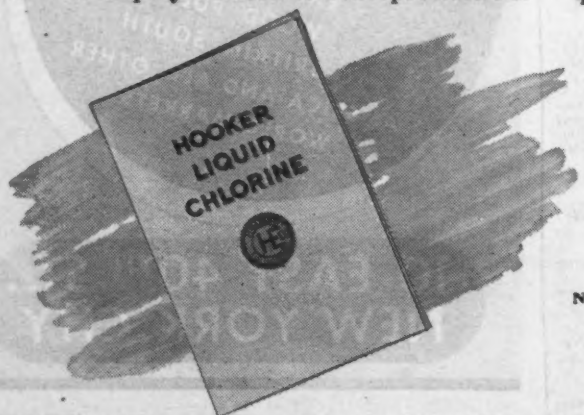
Of increasing interest to pulp and paper manufacturers is the use of chlorine in the abatement and control of costly "slime" growths and deposits in condenser tubes. Many mills report especially gratifying results when chlorinated water is used throughout their systems. A real dollar saving results as well as production of cleaner paper products.

Hooker chlorine has been the choice in pulp and paper mills because of its consistently uniform high quality. Hooker's Technical Staff, too, is at your service in helping you solve any problems involving the use of chlorine and other Hooker chemicals.

HOOKER CHEMICALS

Send for this Hooker Chlorine Booklet

Have you requested your copy of the Hooker "Liquid Chlorine" booklet? It contains helpful information of particular value to new employees. It includes precautions for handling and equipment suggestions as well as physical and chemical data on liquid chlorine. Copies are free when requested on your letterhead.



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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Report of the Joint Textbook Committee—1944*

By R. S. Kellogg[1]

The activities of the Joint Textbook Committee during 1944 are summarized as:

FINANCES

RECEIPTS		
Cash on hand, January 1, 1944	$ 146.16	
Royalties during year	933.16	
Interest on securities	245.25	$1,324.57
EXPENSES		
Bond purchased	504.05	
Salary, editor	300.00	
Textbook revisions	100.00	
Misc. (Postage, supplies, c/o securities, etc.)	97.22	1,001.27
ASSETS, JANUARY 1, 1945		
Cash	323.30	
Securities (cost)	8,322.34	8,645.64

Securities Held for the committee by 42nd Street Branch Central Hanover Bank & Trust Co., New York, N. Y.

$4,000 U. S. Treasury 2½% Due 1956—Int. Mar. 15 & Sept. 15	$50.00
$3,000 Dom. of Canada 4% Due 1960—Int. Apr. 1 & Oct. 1	60.00
$1,000 Wis. Elec. Power 3½% Due 1968—Int. Apr. 1 & Oct. 1	17.50

Textbook Sales

Sales of the textbooks in 1944 totaled 1,014 volumes compared with 871 in 1943 and 790 in 1942. This is striking evidence of the usefulness of the industry's standard publications in war time. Here is the detailed record:

	1944	Total to Date
Volume I	109	5,223
Volume II	104	4,420
Volume III	284	11,310
Volume IV	262	8,893
Volume V	255	7,777
	1,014	37,623

Revisions

For some time past and for as long as necessary in the future, the committee will be actively engaged in preparations for thorough-going revisions of Volumes III, IV, and V of the textbooks leading up to the publication of the fourth edition of these important volumes as soon as possible after the termination of World War II.

In this undertaking, Editor Stephenson is receiving a great deal of assistance from an advisory committee of prominent technical men under the chairmanship of W. G. MacNaughton. This committee is carefully examining and studying the present edition of the books, page by page, paragraph by paragraph, and sentence by sentence, to make certain that all previous errors are eliminated and that the best possible opinions and practices in the industry up to the minute are embodied in the new texts.

Altogether it is probable, that counting authors of the many separate sections of the books and advisors in regard thereto, the work of not less than 100 of the best qualified men in the North American pulp and paper industry will contribute to this big undertaking. It is the intention to so coordinate and time these efforts that the three revised volumes may be brought out simultaneously instead of at prolonged separate intervals, as in previous revisions. All this may involve as much as two years of thorough and painstaking work, but the industry can be assured that the final product will be much superior to anything now in existence upon the manufacture of pulp and paper.

As the financial statement shows, the committee has the funds with which to do the job. This is true because, while the amount of money on hand is not large, we are fortunate in having the cooperation of practically every organization and individual in the industry whose knowledge and experience are at the service of the committee. These contributions are beyond price and are an outstanding example of the manner in which our industry has always worked together to solve common problems in the manufacture of its product.

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Member TAPPI; Secretary, Joint Textbook Committee; Secretary, News Print Service Bureau, New York, N. Y.

TAPPI Notes

The TAPPI New England Section will meet at the Elks Club, Fitchburg, Mass., on Friday, March 16th at 6:30 P.M. Characteristics of Coating Base Raw Stock will be the subject to be discussed by N. I. Bearse and E. H. Barclay.

W. Otis Roe is now general production manager for the Dixie Cup Company, Easton, Pa.

Kenneth E. Youngchild is now in the Sales Department of the American Cyanamid & Chemical Company, 30 Rockefeller Plaza, New York, N. Y.

Howard J. Blake, formerly of the Morley Company is now development chemist for the Rogers Paper Mfg. Co., Goodyear, Conn.

James J. Forsythe, formerly of the Fraser Paper Ltd. is now chief chemist for the Waxide Paper Company, 4410 Hunt Avenue, St. Louis, Mo.

Water Purification with Bentonite*

By H. L. Olin[1] and E. M. Myers[1]

Abstract

This paper is a continuation of studies previously reported and involves the use of bentonite for water purification. Both pilot plant and full scale tests are reported with tabular data.

A "split treatment" in which bentonite fortified with a small amount of alum when needed was utilized and was considered to be satisfactory. It is believed that bentonite water clarification has passed the primary research stage and that it has demonstrated its applicability and value in the treatment of numerous types of water showing promise of lowering the costs of chemical dosage.

Earlier studies *(1, 2)* previously reported, on the use of bentonite as a flocculating agent in water purification were made for the most part on the laboratory scale with the use of the Imhoff cone as the settling basin. Recognizing the need for enlarging the test apparatus and especially for introducing the principle of continuous flow, later a pilot plant *(3)* with a capacity of 60 gallons per hour was constructed on which further investigations of the chemical and physical reactions of bentonite in a water medium were carried through. This paper is a report of these continuation studies made in the summer of 1942 with the pilot set-up and also of two full scale tests on a 1.5 million gallon institutional plant in which combinations of bentonite, lime, and alum were used.

The method followed in most of the later work is that of "split treatment" in which bentonite fortified with a small alum dosage is added, when needed, to bring down the bulk of the turbidity and after a given mixing and sedimentation interval, a final dosage of alum is added to act as a scavenger for any residual turbidity that may persist. This is based on the sound physical principle that salts forming trivalent ions are most economically utilized when applied to systems of low turbidity—an application of the so-called Burton-Bishop rule *(4)*. The pilot apparatus was described in some detail in an earlier paper *(3)*; Fig. 1 is a cut of the set-up in use.

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

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FIG. 1
Front View of Pilot Plant

Dosage, operating conditions and results are shown in the following tables and the data are largely self-explanatory. The conditions and situations met in this work are those of a river supply with rapidly varying values of alkalinity and turbidity so that it was often difficult or impossible to obtain a feed water of a quality even approximately constant during the 24 hour run. Except as otherwise indicated the numbered tests as listed in the tables were made at 3 hour intervals while the over-all time for any continuous run was never less than 24 hours. It should be noted particularly that comparisons between the results obtained in these pilot runs and those from any other type of equipment are relative only and that the data obtained in the small-scale set-up do not necessarily duplicate those that would be observed with similar dosages in a large plant where turbulence and other factors are greatly different. Expressed in other words, "dimensional similarity" holds in the parallel runs of each type of plant only and all com-

TABLE I.—WATER CLARIFICATION WITH BENTONITE-ALUM; SPLIT DOSAGE

May 12-13

	Raw River Water				As Applied to Filters			Dosage		
Test Number(*)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.	Lime, g./gal.
425	66	300	250	8.2	19	236	8.2	..	3.9(a)	0.9(d)
426	66	300	254	8.2	14	244	8.3	..	3.9	1.9
427	68	320	246	8.2	13	234	8.2	..	4.7	2.3
428	73	200	246	8.2	11	224	8.1	2.5	2.1(b)	1.0
429	68	310	254	8.3	9	240	8.2	2.1	2.1(b)	1.0
430	68	290	260	8.2	9	252	8.3	1.8	1.8(b)	0.9
431	66	320	258	8.3	9	242	8.3	2.7	2.3(b)	1.1
432	68	300	260	8.2	8	238	8.2	2.3	2.3(b)	1.0
433	70	400	264	8.2	9	240	8.3	3.2	2.8(c)	1.0

(a) Alum dosage alone.
(b) Alum added 3 hours after bentonite.
(c) Alum added with bentonite.
(d) Lime added in first mixer.
(e) Tests made at 3 hour intervals.

TABLE II.—WATER CLARIFICATION WITH BENTONITE-ALUM; SPLIT DOSAGE

May 15-16

	Raw River Water				As Applied to Filters			Dosage			
Test Number(*)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.		Lime, g./gal.
434	64	800	204	8.2	24	188	8.3	..	3.8(a)		2.8(d)
435	64	650	200	8.0	16	196	8.3	..	5.3		4.5
436	64	620	200	8.0	11	196	8.2	..	5.6		2.4
437	64	600	200	8.0	11	190	8.1	..	4.7		2.0
438	64	550	212	8.0	19	188	8.1	2.5	2.3(b)		2.0
439	63	560	220	8.1	16	204	8.0	2.5	2.5		1.0
440	68	440	212	8.0	16	200	8.2	3.7	3.7		3.0
441	61	540	224	8.0	11	204	8.2	3.2	2.6		1.0
442	63	520	220	8.1	8	202	8.1	2.5	1.7	1.1(c)	..
443	63	520	226	8.1	6	200	8.0	2.5	1.7	1.1	..

(a) Alum used alone.
(b) Secondary alum added in split dosage.
(c) Alum added in first mixer with bentonite.
(d) Lime added in first mixer.
(e) Tests made at 3 hour intervals.

parisons must be made on that basis. As a rule dosages are lower in the large plant for equivalent results i.e. efficiencies and economies are higher because of the better mixing obtained.

Table I shows the results obtained on a river water in a mid-period between seasonal spring storms with the typical turbidities usually observed at this time of the year. Even during one 24 hour period however, the silt load may vary greatly (as much as 100% in this case) and it may be easily understood why definite and reproducible results are not always easy to obtain.

Storm water had come down previous to the run reported in Table II. The mud content was up and variable and the pH was down by a decimal point. Optimum results were obtained by the addition of alum to the bentonite in the first mixer to bring about the rapid flocculation of the clay (tests 442 and 443) upon which the major part of the silt precipitation depends.

Early in the morning of May 20 (see Table III) a heavy rain storm caused a sudden and sharp rise in the raw turbidity which called for a corresponding increase in the chemical dosage. In such an emergency the immediate objective is mud removal regardless of considerations of economy and the dosages indicated are doubtless higher than would be needed in a constant and uniform flow of water with a turbidity in this range. Flash floods in fact may stir up mud to values of 4,000 or more and in such cases the filters themselves must do their part in carrying the extra load.

TABLE III.—WATER CLARIFICATION WITH BENTONITE-ALUM; SPLIT DOSAGE

	Raw River Water				May 19-20 As Applied to Filters			Dosage			
Test Number(a)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.		
444	66	280	256	8.2	18	240	8.2	1.4	1.5(a)		
445	66	290	254	8.2	11	240	8.2	1.4	1.4		
446	68	280	256	8.2	10	244	8.1	1.4	1.3		
447	67	290	260	8.2	13	240	8.1	1.8	1.7		
448	67	400	256	8.2	13	242	8.1	2.5	2.5		
449	67	400	254	8.2	11	236	8.1	2.5	1.3	1.1(b)	
450	65	750	252	8.2	11	230	8.0	2.5	1.3	1.1	
451	..	800	...	..	..	...	..	3.0	1.7	1.4	
452	..	1050	...	..	..	...	..	3.3	2.2	1.4	
453	..	1150	...	..	..	...	..	..	..	..	
454	65	1150	236	8.1	8	214	8.0	3.6	2.6	1.3	
455	65	1200	230	8.1	6	218	7.7	4.1	2.9	1.4	
456	65	1350	218	8.1	6	208	7.7	..	..	..	7.4(c)
457	65	1300	220	8.0	6	200	7.5	..	..	..	8.3

(a) Secondary alum—split dosage.
(b) Alum added with bentonite in first mixer.
(c) Alum dosage alone.
(d) Tests made at 3 hour intervals.

TABLE IV.—BENTONITE FERRISUL CLARIFICATION; SPLIT DOSAGE

	Raw River Water				May 22-23 As Applied to Filters			Dosage			
Test Number(d)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Ferrisul, g./gal.	Alum, g./gal.	Lime, g./gal.
458	65	700	232	8.2	8	204	7.9	..	..	4.4(b)	..
459	65	600	234	8.2	6	214	7.8	..	..	4.2	..
460	65	600	226	8.1	6	216	7.6	..	..	4.2	..
461	66	560	240	8.1	6	220	7.7	..	..	4.2	..
462	64	480	242	8.1	8	244	8.1	2.3	1.0(a)	..	1.0(c)
463	64	420	240	8.1	8	220	8.1	1.1	0.5	..	0.5
464	70	260	236	8.1	8	224	8.1	1.4	1.1	..	1.1
465	68	360	238	8.2	7	220	8.0	1.2	1.0	..	..
466	66	420	234	8.2	6	210	7.9	1.2	1.2	..	..

(a) Ferrisul in split dosage.
(b) Alum dosage alone.
(c) Lime added in first mixer.
(d) Tests made at 3 hour intervals.

TABLE V.—WATER CLARIFICATION WITH BENTONITE-ALUM; SPLIT DOSAGE

	Raw River Water				June 2-3 As Applied to Filters			Dosage		
Test Number(c)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.	
467	80	170	258	8.2	24	250	8.0	..	1.2(a)	
468	80	180	254	8.2	19	250	8.0	..	1.7	
469	81	170	256	8.2	19	236	8.1	..	2.3	
470	81	170	258	8.2	19	240	8.0	..	2.7	
471	81	170	260	8.2	13	250	8.1	1.5		1.4(b)
472	81	170	258	8.2	11	246	8.0	1.5		1.4
473	81	170	256	..	9	240	8.1	1.5		1.4
474	81	170	260	8.2	9	238	8.1	1.6		1.6
475	81	170	258	8.2	9	240	8.1	1.6		1.6

(a) Alum dosage alone.
(b) Alum added in split dosage.
(c) Tests made at 3-hour intervals.

TABLE VI.—WATER CLARIFICATION WITH BENTONITE-ALUM; FLASH FLOOD CONDITIONS

	Raw River Water				June 5-6-7 As Applied to Filters			Dosage			
Test Number(c)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.		Lime, g./gal.
476	82	240	256	8.1	24	250	8.0	1.8	1.8(a)		..
477	84	240	254	8.1	21	244	8.0	1.8	1.8		..
478	84	270	258	8.2	16	246	8.0	2.3	1.3	0.5(c)	..
479	82	300	260	8.2	11	238	8.0	2.3	1.8	0.5	..
480	82	340	260	8.1	11	228	7.9	2.7	2.1	0.5	..
481	81	380	244	8.1	11	224	7.8	..	..	5.4(b)	..
482	83	400	236	8.0	13	188	7.8	..	..	5.4	..
483	79	860	210	8.0	33	188	7.7	..	..	7.0	..
484	..	1280	...	..	...	...	..	..	..	7.0	..
485	80	2500	140	7.9	110	142	7.6	..	..	7.0	..
486	81	2700	120	7.9	105	126	7.6	..	..	8.4	..
487	..	2800	...	..	...	...	..	..	..	9.4	..
488	80	2900	102	7.7	100	122	7.6	..	..	9.4	..
489	..	2950	...	..	...	...	..	..	..	11.5	..
490	79	3000	100	7.7	105	114	7.5	5.7	..	..	1.8
491	79	3000	102	7.7	110	116	7.6	5.7	..	..	1.8

(a) Alum added in split dosage.
(b) Alum dosage alone.
(c) Alum added with bentonite.
(d) Lime added in first mixer.
(e) Tests made at 3-hour intervals.

A variation in the chemical treatment was made in the next series (Table IV) with the use of "ferrisul," an iron salt, as a coprecipitant, instead of alum. As indicated, excellent results were obtained with relatively low chemical feeds and without undue drop in applied alkalinity.

Tables V and VI illustrate conditions and treatment of waters at opposite extremes of turbidity, the first with values unusually low for the season and the other with the silt load raised high by a flash flood. In the latter case a significant drop in the total alkalinity complicated the purification procedure.

The difficulties presented by a *receding* flood and *dropping* values of turbidity are demonstrated by the figures of Table VII which show that even with heavy chemical dosages the applied turbidities obtained were abnormally high. It is not an uncommon experience

in water treatment to find in the wake of a flood a residual silt abnormally fine in size and extremely slow to settle, a condition in harmony, of course, with Stoke's Law but involving doubtless in addition an unusual concentration of protective colloids. Low alkalinities because of the influx of storm water contributed to the difficulties encountered and made necessary a high alum dosage in the first mixer.

Full-Scale Treatment Tests

The climax of this phase of the research project was reached in two successful continuous runs of 52 and 64 hours respectively on a full-scale purification plant which was operated under normal conditions except for a modification in the amount and kind of chemical treatment employed.

The Iowa University water plant used in this work was designed to treat 1,500,000 gallons per day with a detention period of 6 hours. It is entirely modern in its equipment with the standard devices for pre- and post-chlorination and post-ammonification. It has in addition the usual coagulant feeders, a roof aerator and an aeromix, used during the winter months only.

The mixing and flocculating device consists of a concrete basin 40 feet long, 17 feet deep and 4 feet wide with over-and-under baffles spaced from 4 to 16 inches apart, through which the water flows at velocities varying with the pumpages of from 0.4 to 1.5 feet per second. A stilling chamber similar to the mixer but without baffles and two settling basins 40 feet square and 15 feet deep provide the necessary prefilter detention. Carbonation basins were included in the original construction to permit lime-softening treatment in the future if desired but at present their function is stand-by only. Three filters of the usual rapid sand type have capacities of 0.5 million gallons per day each. The chemical dosage in normal plant operation includes pre-chlorination of the raw water 2 or 3 minutes before aeration, followed immediately by the addition of the coagulants, alum, and lime.

In order to conform to the principles of split treatment as practiced in the pilot work a double mixer and settling basin system was provided in the first of which the bulk of the suspended load was removed by means of the clay floc while in the second the light residual turbidity was brought down by a trivalent coagulant such as alum or iron. In carrying out the large-scale tests reported in Tables VIII and IX, however, we were limited to the use of a plant admirably equipped in every respect except provision for splitting the dosage. Accordingly, we proceeded with single dose operation and while the results obtained doubtless fall short of what both theoretical considerations and previous experience might lead up to expect had the improved technique been used, they are nevertheless highly satisfactory when considered on their merits alone. In spite of somewhat variable raw turbidities, operations proceeded smoothly, applied

TABLE VII.—WATER CLARIFICATION WITH BENTONITE-ALUM; RECEDING FLOOD CONDITIONS

	Raw River Water				June 12-13 As Applied to Filters			Dosage			
Test Number(a)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.		Lime, g./gal.
492	75	1200	156	7.5	130	144	7.8	..	5.7(a)		2.0(c)
493	75	1250	150	7.5	70	136	7.6	..	8.4		3.0
494	75	1100	144	7.6	50	138	7.5	..	9.0		3.0
495	75	1000	146	7.5	60	130	7.6	..	9.0		4.0
496	75	1000	140	7.5	80	132	7.5	4.7	..	4.3(b)	2.0
497	74	1000	130	7.5	55	128	7.6	4.7	..	4.3	4.0
498	74	900	128	7.4	50	124	7.5	4.7	..	4.3	3.0
499	73	850	130	7.5	40	126	7.4	4.7	..	4.3	3.0
500	73	850	132	7.5	30	128	7.5	4.7	..	4.3	3.0

(a) Alum dosage alone.
(b) Alum added in split dosage.
(c) Lime added in first mixer.
(d) Tests made at 3-hour intervals.

TABLE VIII.—FULL SCALE WATER TREATMENT; BENTONITE-ALUM (1)

	Raw River Water				June 17-18-19 As Applied to Filters			Dosage		
Test Number(c)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.	Lime, g./gal.
501	..	370	148	7.7	5	154	7.9	0.7	2.2(a)	1.2(b)
502	69	380	152	7.6	8	158	7.9	0.8	1.7	1.0
503	..	380	168	7.7	8	148	7.4	2.4	2.3	1.0
504	67	360	164	7.7	6	...	..	2.0	1.9	1.0
505	..	345	...	..	10	136	7.9	1.2	1.3	1.1
506	74	300	170	7.6	15	164	7.7	1.2	1.1	1.0
507	..	290	174	7.7	10	172	7.8	1.3	1.2	0.7
508	..	290	180	7.7	9	184	7.7	1.4	1.4	0.8
509	..	300	186	7.7	6	180	7.5	1.5	1.4	0.8
510	69	270	194	7.7	8	...	..	1.0	1.3	0.6
511	..	260	...	..	10	188	7.7	1.0	1.2	0.5
512	73	250	206	7.6	7	184	7.6	1.4	1.4	0.7
513	..	260	200	7.6	8	184	7.6	1.4	1.3	0.7
514	..	260	204	7.6	8	186	7.6	1.4	1.3	0.7

(a) Alum added with bentonite.
(b) Lime added with bentonite.
(c) Tests made at 4-hour intervals.
Pre-chlorination, 0.48 g./gal. All clear well turbidities, 0.

TABLE IX.—FULL SCALE WATER TREATMENT; BENTONITE-ALUM (2)

	Raw River Water				June 25-26-27 As Applied to Filters			Dosage		
Test Number(c)	Temperature, ° F.	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Turbidity, p.p.m.	Total Alkalinity, p.p.m.	pH	Bentonite, g./gal.	Alum, g./gal.	Lime, g./gal.
515	71	580	210	7.9	4	184	8.0	1.5	1.6(a)	1.2(b)
516	..	600	216	7.8	5	190	7.9	1.4	1.2	0.9
517	72	500	220	7.8	4	200	7.9	1.2	1.2	0.8
518	..	450	208	8.0	5	204	8.1	1.2	1.3	0.9
519	70	440	224	8.0	5	208	8.2	1.1	1.0	0.6
520	..	425	238	8.0	8	208	8.1	0.9	0.9	0.6
521	71	300	236	8.0	6	204	7.9	1.0	1.1	0.4
522	..	350	228	7.9	6	212	8.0	1.2	1.0	0.4
523	70	350	232	7.9	6	212	7.9	1.0	0.9	0.3
524	..	400	232	8.0	6	220	7.9	1.2	1.0	0.3
525	70	300	228	7.9	4	222	7.8	0.9	0.9	0.3
...	..	Plant off 1:30-5:00 A.M.			..	...	..	1.3	1.2	0.3
526	70	290	244	8.0	5	220	7.7	0.9	0.6	0.2
527	..	300	248	7.9	7	226	7.6	1.1	0.9	0.2
528	73	300	240	7.9	6	230	7.8	1.3	1.3	0.4
529	..	300	250	7.8	7	230	8.0	1.1	1.2	0.6
530	74	310	250	8.2	6	...	..	1.1	1.2	0.6

(a) Alum added with bentonite.
(b) Lime added with bentonite.
(c) Tests made at 4-hour intervals.
Pre-chlorination, 0.46 g./gal. All clear well turbidities, 0.

TABLE X.—SUMMARY OF AVERAGE OPERATING CONDITIONS

University of Iowa Water Plant, Summer 1942

Month	No. of Sampling Days	Raw Turbidity p.p.m.	Applied Turbidity	Alkalinity p.p.m.	Chlorine g./gal.	Lime g./gal.	Alum g./gal.
May-June	10	542	5	222	...	1.1	1.3
July	13	1283	11	198	0.55	2.4	5.6
August	8	274	6	212	0.47	0.55	1.9
September	10	497	11	193	0.56	0.95	3.3
Weighted overall averages	41	714	8	205	0.53	1.4	3.7

turbidities were kept well within the conventional limits and chemical consumption was low.

As a means for comparing the results obtained in the special tests with those observed in the normal operation of the plant, averages of a considerable number of daily operating data are compiled from the plant records, in Table X, covering the summer season of 1942 from May through September. e.g., the average turbidities and alkalinities of the raw water on ten representative days of May and June were 542 and 222 respectively and the lime and alum dosages 1.1 and 3.2 grams per gallon. Similar samplings of the records were made for the wet month of July when turbidities were high and for the dryer months of August and September. The weighted over-all averages given should fairly represent the variations of chemical dosages with changing values of raw turbidity and alkalinity.

In support of the favorable results observed in the limited studies the fact may be cited that bentonite has been used over a period of many months in a municipal water plant of a north-central Wisconsin city on a river water less turbid and variable to be sure than the one just discussed but which nevertheless presents its own peculiar difficulties. No operating data are available for publication at present but results have been highly satisfactory. In any case it can be said that bentonite water clarification has passed the primary research stage, that it has demonstrated its applicability and value in the treatment of many of the vastly numerous types of water encountered in municipal and industrial operations and that it shows promise of lowering the costs of chemical dosage.

Literature Cited

1. Olin, H. L., and Peterson, H. W. The use of bentonite as a coagulant in water treatment. *J.A.W.W.A.*, 29, 513 (1937).
2. Olin, H. L., and Gauler, J. V. The use of bentonite in water purification. *J.A.W.W.A.*, 30, 498 (1938).
3. Olin, H. L., and Freeman, Harry F. Purification of water with bentonite. *Paper Trade J.*, 113, no. 19: 38-42 (Nov. 6, 1941).
4. Burton, E. F., and Bishop, E. Coagulation of colloidal solutions by electrolytes. *J. Phys. Chem.*, 24, 701 (1920).

A Paper Board Mill's Attack on Stream Pollution*

By Thomas E. Brookover[1]

Abstract

The experiences of a board mill in combating fiber loss and stream pollution are discussed.

The Bird saveall, the Link Belt recovery system, straight sedimentation, and the Infilco Accelator Clarifier have been used. The merits of each as well as the difficulties encountered are outlined.

The final waste discharge to the creek averages over 2,000,000 gallons per day and 25 to 30 p.p.m. total suspended solids.

Public and political emphasis on the prevention of stream pollution has developed in relatively recent years. However, many years ago, there were those in the paper industry who realized the importance of the problem and attempted to solve it. Comparatively little progress was made simply because the industry as a whole did not combine the knowledge attained in individual cases. It is gratifying that such steps are now being taken by the National Council for Stream Improvement, Inc.

As early as 1910 the Downingtown Paper Company was using an electrolytic process in conjunction with sedimentation for clarification of the waste water. An effluent of exceptional clarity was obtained, but the method was discontinued because of high maintenance costs, constant attention required, and excessive foaming when the clarified water was recirculated on the machine.

At present there are three board machines in operation. Each machine is contained in a separate building, and the layout of the individual units is such that the handling of the waste water is more complicated than would be necessary with a more compact arrangement. It is well to keep this in mind during the following discussion.

Bird Saveall

In 1924 a Bird saveall was installed to reduce the fiber loss in the waste water, and this equipment is in use today. Thickened stock from the saveall is pumped to a mix box in which it is rediluted with raw waste before passing to a two cylinder wet machine specifically set up for the purpose. A sheet is formed on the cylinders and carried by a wet felt through a pair of press rolls, is removed by a doctor blade, and drops onto a hand truck. The sheet thus obtained is 25% dry fiber and is reused as filler stock.

Tests have shown efficiencies of from 0 to 75% in removal of suspended solids by the saveall, depending upon the ratio of long to short fibers in the waste water. At times, wastes containing 175 p.p.m. suspended solids have shown no apparent reduction in passing through the saveall even though fine wire was used.

The capacity of the installation has been exceeded because of increased plant production and it can no longer handle the total flow.

From experience with this type of equipment the following conclusions have been drawn:

1. If waste treatment is to yield reusable fiber, it must be so located that material handling will not be complicated.
2. Units such as the Bird saveall should be placed where they will handle wastes of higher concentrations and where their volume capacity will not be exceeded.
3. Although a thickener cylinder will remove long fibers efficiently, it will not remove finely divided solids and colloidal materials as is necessary if the receiving stream is to be unaffected.
4. As implied by the above points, the maximum benefits are not realized from the present saveall installation.

Link Belt Recovery System

In 1930 a Link Belt sedimentation unit was installed to treat the waste water of two adjacent mills. The installation was to serve three purposes: 1. to

*Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

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recover suspended solids for reuse in filler stock; 2. to obtain a fairly clear white water for recirculation; and 3. to reduce the ultimate pollution load in the final waste.

The installation consists of four identical basins side by side and operating in parallel. Each basin is 16 feet wide, 55 feet long, 10 feet deep, and has a volume of 66,000 gallons.

Each basin has a set of 12 scraper bars mounted transversely on chains operating on properly placed sprocket wheels. The scrapers, driven at a rate of 1 foot per minute by a 3 hp. motor through a common shaft, move toward the outlet end on the surface and toward the inlet end along the bottom to scrape the settled sludge into submerged pits.

The inlet and outlet ports are submerged at opposite ends of the basins.

Floating materials are pushed toward the outlet end by the scraper bars and removed by manual scraping into a trough filled with water which carries the solids to an open trap; the floating material is retained and removed manually at intervals, and the carrying water is drawn off below the surface.

As previously indicated, the sludge is collected in submerged pits. It is removed periodically through manually controlled valves into an open external pit. From this second pit the sludge is pumped to the filler system in one of the mills whose main production is chip board. The sludge has varied in consistency from 1.25 to 1.75% solids.

The so-called clear water is used for the most part in the chip mill on felt showers and as stock process water.

For several years, alum was fed to the raw waste entering the basins to clarify the water as much as possible. Soda ash was added to the effluent to obtain a neutral water for reuse. No data are available on actual results then obtained but it is known that the operation was not dependable. After final waste treatment basins were installed to handle the combined wastes of all mills, this practice was discontinued—for without coagulation the effluent was suitable for its intended use and the extreme fines and colloidal materials in the overflow were taken care of in the final waste treatment works.

A difficulty encountered, especially when alum was used, has been that of "floating" stock. Much effort is required for its removal when the condition is aggravated. It may result from one or several causes: air leakage into the supply pump, low rate of sludge removal which allows a build up in the basins, or collection of the solids in stagnant pockets where decomposition may occur.

The Link Belt system, as installed at our plant, requires an attendant at all times. His duties consist of operating the sludge removal valves and pumps as required by the demand in the mill, removal of floating materials, regulation of water level in basins, cleaning the rag racks at the basins' inlet and routine maintenance of the equipment.

TABLE I.—LINK BELT RECOVERY SYSTEM
Efficiency of Suspended Solids Removal

A.—Average of Twelve Surveys 1939-1941. Flow Rate—not metered 1,000,000 to 1,500,000 gal. per day

Suspended Solids	Basin Inlet p.p.m.	Basin Outlet p.p.m.	Removal Efficiency %
Volatile	280	70	75
Fixed	88	55	35
Total	368	125	66

B.—Average of Eight Surveys 1944. Flow Rate—as in A.

Suspended Solids	Basin Inlet p.p.m.	Basin Outlet p.p.m.	Removal Efficiency %
Volatile	388	46	88
Fixed	118	35	70
Total	506	81	84

Repair costs on this system have been relatively low. The main trouble has been in the failure of the scrapers or chain, but this has been infrequent, and at times has been caused by an overloaded basin in which heavy sludge has stalled the scrapers.

Table I, covering two periods of operation, indicates the average degree of efficiency in removal of suspendeds with no addition of alum.

It is apparent that the system is relatively efficient without a coagulant. The greater efficiency in the 1944 surveys may be because of the longer fibered stock in the waste carrying the fines with it in settling.

To summarize, the advantages of such a system appear to be:

1. The relatively small number of working parts, resulting in infrequent mechanical failure and low maintenance cost.
2. The efficiency of suspended solids removal.

Its disadvantages are:

1. The possibility of sludge overload stalling and breaking the scraper chains.
2. The stock or sludge may float rather than settle.
3. The objectionable odor caused by the stagnant sludge when decomposition takes place.
4. In the case of this installation, the manual supervision required for the amount of stock reclaimed.

Final Sedimentation Basins

Waste from the third mill joined the overflow from the Link Belt system and, after part passed through the Bird saveall, it contained fines and colloidal material but relative little long fibered stock. Immediate action was desired by the Pennsylvania Department of Health and straight sedimenation was suggested.

The installation, completed in 1937, consists of two concrete basins operating in parallel. Each basin is 400 feet long, 60 feet wide at the top, with sloping sides to a 40 foot wide bottom, 7 foot maximum depth, and a volume of approximately 1,000,000 gallons. The combined volumes were to give a 24 hour retention: this is theoretical only, for dye tests have shown that water passes from inlet to outlet in 1 hour.

A sump ditch along the bottom of each basin facilitates cleaning. Baffle boards are placed across the basins at intervals; these extend a few inches below the surface and prevent floating materials from reaching the overflow. Water enters each basin through submerged inlet ports across its full width. The effluent passes over a full width level overflow.

Before entering the stream combined effluents from the two basins pass into a common channel and over a rectangular weir on which is mounted a float operated flow recorder.

Ferric sulphate as well as a carbon-alum combination have been tried in place of alum alone as a coagulant, but straight alum has proven the most satisfactory, and the cheaper grades are used when available. The raw waste contains sufficient alkalinity, and the use of lime or soda ash in conjunction with alum has not proven beneficial. Experiments are being conducted at present with activated silica as a coagulant aid, but no definite conclusions have been drawn. An alum dosage of 100 to 135 p.p.m. (6 to 8 grains per gallon) has been necessary for best results in removal of turbidity.

No special operator is necessary for the sedimentation basins. The filter plant engineer charges the continuous alum feeder and cleans the sewer rack ahead of the basins' supply pump.

Operating conditions of the basins vary from time to time, depending on the volume of production and

types of board produced. Table II, however, is indicative:

TABLE II.—FINAL WASTE WATER SEDIMENTATION BASINS SUMMARY OF OPERATION—NOVEMBER, 1944

Av. daily production, tons	226
Av. daily flow of waste water, gallons	2,226,000
Av. waste water per ton of board, gallons	9,875
Alum consumption-pounds per day	2,450
pounds per ton of board	10.8
p.p.m. in waste water	132

	Raw Waste Before Alum Addition	Final Effluent
pH	6.7	5.6
M.O. alkalinity, p.p.m. $CaCO_3$	82	40

Suspended Solids	Basin Inlet p.p.m.	Basin Inlet lb./ton	Basin Outlet p.p.m.	Basin Outlet lb./ton	Removal Efficiency %
Volatile	366	30.1	19	1.6	94.8
Fixed	81	6.7	6	0.5	92.6
Total	447	36.8	25	2.1	94.4

Dissolved solids—not checked regularly—vary from 500 to 700 p.p.m. and are roughly 50% volatile

Efficiency is not entirely satisfactory in expressing sedimentation results unless the suspended solids content of the raw waste remains fairly constant. These basins have operated above 97% efficiency at times simply because the raw waste contained excessive amounts of suspended solids. The actual suspended solids content of the effluent best expresses the performance of sedimentation basins. Results ranging from 4 to 60 p.p.m. suspended solids have been obtained in the effluent under normal operation.

Naturally, sedimentation serves primarily for suspended solids removal once the water is treated with the coagulant, but the effect of the alum on the so-called dissolved solids is interesting. After passing through a fine asbestos pad, the filtrate of the raw waste is turbid while that of treated waste, with proper alum dosage, is clear. In eleven recent surveys it was found that the raw waste averaged 344 p.p.m. volatile dissolved solids while the alum treated waste averaged 275, an average reduction of 20%. Sedimentation with low alum dosages will remove much of the suspended content, but higher dosages, with resultant acidity, are necessary to destroy the colloidal properties of board mill wastes and obtain maximum clarity. Sulphuric acid could be substituted for part of the alum, but it is believed that the economy involved would not compensate for the risk in handling the acid.

Some general remarks on B.O.D. reduction are in order. The determination is not done at the plant, but the Pennsylvania Department of Health Laboratories have assisted by making occasional tests. To date, there has been no definite relation between solids content and B.O.D., and samples with relatively high volatile solids content have given low B.O.D. In one particular survey the combined and individual effluents were sampled compositely over an 8-hour period; although solids analyses indicated the combined as an average of the individual effluents, the B.O.D. of the combined effluents was appreciably greater than either of the individual effluents. The 5-day B.O.D. of the alum treated waste has varied from 54 to 415 and that of the effluent from 13 to 200. Variation in percentage B.O.D. reduction forbids the statement of an average.

For proper maintenance of operating efficiency the sedimentation basins must be cleaned every 3 or 5 months, depending upon the load handled.

Sludge Basin

Before the operating efficiency is affected, one basin is removed from line, placing the full load on the remaining basin, the excess clear water is drained from the idle basin and the sludge present is removed by pumping into a large sludge basin.

The sludge basin is an excavation of approximately 10,000 to 12,000 square yards area and may be filled to an average depth of 4 feet with the sludge.

The sludge to be removed from the sedimentation basins is compact and cohesive and for the most part could not be reclaimed. It must be broken up by directing water from a fire hose (supplied by a gasoline engine driven centrifugal pump) upon it. The free flowing sludge is then pumped from the sedimentation basins to the sludge basin (by gasoline engine driven diaphragm pumps). Each 400 foot basin requires at least 2 weeks for cleaning with two men working 12 hours a day.

Once the sludge is in the sludge basin, it is allowed to settle and the clear water is gradually drained off. When the sludge basin fills, the sludge, at this point 80% water, is finally removed by a power shovel and hauled to the mill dump by truck. When dried the sludge becomes extremely hard, and samples have retained this hardness after a year's immersion in water.

From the foregoing discussion the following favorable features of straight sedimentation can be noted:

1. Simplicity of control.
2. Absence of mechanical parts in normal operation.
3. High efficiency in removal of suspended solids as long as proper operation can be maintained.

Unfavorable features of straight sedimentation are as follows:

1. It is uneconomical for there is a definite loss with no return.
2. Handling the settled sludge is an expensive item, especially for a plant of our type.
3. Waste passing through the basins comes in contact with the relatively stagnant body of settled solids and thus may carry off further pollution into the stream.
4. The basins may be upset by atmospheric conditions. Lowered atmospheric pressure is sometimes accompanied by large masses of sludge rising to the surface. High winds can carry suspended solids to the outlet.
5. The inclusion of what amounts to batch operation in line with the continuous flow is generally unsatisfactory as well as dangerous. In fact, within the past 2 years a series of events prevented cleaning of the sludge pit in time, which in turn prevented cleaning the basins, resulting in overloaded basins and discharge of suspended solids to the stream.

The unfavorable features overbalance the favorable, and this fact led the company to seek a more satisfactory solution of the problem.

Infilco Accelator Clarifier

It was realized that actual fiber reclamation should be accomplished as close as possible to the point of loss from the process. It was also realized that regardless of the efficiency of stock saving devices there would be present in the final waste an appreciable amount of fines and colloidal materials, requiring removal before the water was discharged into the stream. Interest was aroused by inspecting an installation of the Infilco Accelator Clarifier used for clarification of highly turbid Delaware River water.

Samples of waste were submitted to Infilco, Inc., for examination, and they expressed confidence in their ability to handle the problem. Since this was the first application of the Accelator for treatment of paper mill wastes, a unit was installed on a trial basis.

The principle of this equipment is that of building up floc particle size by adding the raw waste and coagulant to a fairly concentrated slurry with appreciable agitation and thus increase the ultimate rate of separation of the clarified water from the solids. This separation occurs in the outer quiescent portion of the tank: the clear water rises from the slurry bed to the overflow; part of the slurry recirculates to receive the raw waste and part is drawn into con-

centrators from which the solids are removed in the form of sludge through electrically controlled discharge valves operating on a desired time cycle.

Two appealing features with reference to the mill's problem are the constant circulation within the unit, preventing stagnation and decomposition, and the continuous removal of solids. The solids, as sludge, are returned to the filler stock system in one of the mills.

The length of this paper forbids a detailed description of the Accelator design, but many are familiar with it. It suffices to say that the above action is accomplished by proper annular construction within the tank. Two propellers on one central vertical shaft, driven by a 5 hp. motor through a variable speed mechanism, provide the circulation and agitation.

The equipment installed at the plant is contained in a wooden tank with stone and concrete foundation. The tank is 38 feet in diameter, 16 feet 9 inches deep (maximum), and has a capacity of 130,000 gallons. The unit is designed to handle a maximum flow of 3,000,000 gallons of water and 6,000 pounds of suspended solids per day. It has been installed in series with and ahead of the final sedimentation basins.

Before going farther it is wise to say that the unit has not been continually successful. The fault has not been wholly that of the equipment. Because of an unfortunate circumstance within the mills, the solids load on the unit was often four times greater than that on which the design was based. Solids were not removed rapidly enough and built up in the unit, decreasing and finally preventing the desired recirculation of slurry. Consequently, operating results to date are not considered final.

The extreme load conditions have been reduced, and the solids load is now more acceptable. It was also necessary to eliminate air leakage into the waste water pump supplying the Accelator, for such air leakage resulted in flotation of the suspended solids. Finer sewer racks were installed to reduce the number of rags, strings, and pieces of cellophane entering the unit: these materials collected at various spots and built up in the bottom of the tank where they clogged the blow-down lines installed to remove heavy materials.

The manufacturer of the equipment suggested the advisability of various design changes and made arrangements for the same. Generally, the modifications centered on improving circulation of the slurry and removal of sludge by decreasing flow resistance. These changes are in progress at the time of this writing. It is understood that more recent installations for similar work are designed in accordance with these modifications.

A general discussion of results obtained is interesting. With a clean unit excellent results were obtained, the flow was clear and suspended solids concentrations of less than 30 p.p.m. were obtained in the effluent. The sludge discharged varied from 0.3 to 0.6% and averaged above 0.4% consistency. These results were obtained on flows of raw waste not exceeding 2,500,000 gallons per day and containing up to 1000 p.p.m. suspended solids.

It requires little calculation based on the preceding data to show that over 20,000 pounds of suspendeds per day entered the equipment at times, and of this amount the average removed in the sludge was 12,000 with a maximum of close to 15,000 pounds per day. The result was inevitable — a gradual build up of solids in the unit and progressively decreasing efficiencies.

The relatively large volume of sludge required for solids removal under these conditions could not be handled directly in the filler stock system of the mill. An interesting solution of the problem was to pipe the sludge directly to the two cylinder wet machine normally used in conjunction with the Bird saveall. Indeed, it was the sight of the continuous sheet of reclaimed stock coming off the machine that emphatically drove home the point that stock losses were more than mere laboratory reports and that the waste system was definitely overloaded.

For a period of 2 months a portion of the sludge, containing up to 4,000 pounds of solids per day, was pumped to a filler stock system handling 40 to 50 tons of stock per day with no deleterious results in the mill production.

The following table (Table III) is taken from a waste survey after the Accelator had been operating several weeks in an overloaded condition.

TABLE III.—DATA ON CLARIFIER OPERATION—MAY 2, 1944

		Raw Waste Accelator Inlet	Sludge Discharge	Clarifier Effluent
Flow, gal. per 24 hours		2,500,000	420,000	2,080,000
Alum dosage, p.p.m.		120	—	—
Suspended Solids, p.p.m.	Volatile	708	2,650	198
	Fixed	202	754	52
	Total	910	3,404	250
Total suspended solids, pounds per 24 hours		19,000	11,930	4,330

The solids leaving the clarifier in the above case amounted to 16,250 pounds or 3,750 less than the amount entering, which accounts for the accumulation of solids within the tank. It is interesting that the amount of solids removed in the sludge is roughly twice the 6,000 pounds planned on as the maximum solids load, and on this the optimism of the unit's ultimate success is based now that the solids load has been reduced and changes in design are being made.

With the Accelator finally in operation a satisfactory method of suspended solids removal is expected. The sedimentation basins will remain as a follow up to guarantee a final effluent of maximum clarity, but their cleaning and subsequent waste solids handling will be reduced to a minimum. From past performance it is believed that the Accelator will operate without manual control; daily checks will be necessary, but these will be made by the laboratory. Occasional drainings will probably be necessary to remove accumulated gravel, metal, etc., but proper blowdown lines should take care of this in later models and may yet assist in ours. The power cost of the 5 hp. agitator motor is certainly acceptable. Regular checks on lubrication of bearings, as is necessary for all machinery and pumps will be required. However, unless some unforeseen factor arises, the advantages of the method definitely outweigh the disadvantages in our case.

Although this paper has centered on board mill wastes alone, it is hoped the discussion may be of value and interest to others confronted with the problem of prevention of stream pollution. It is not intended as a summary of an ideal set up, for we realize and admit our own errors. Industry must accept its full responsibility and show definite progress in stream improvement, but the future solution of the problem will be realized only after the industry and regulatory agencies cooperate to their mutual advantage.

Chemical Defoamers in the Manufacture of Pulp and Paper*

By Walter B. Morehouse [1]

Abstract

Classes of foam encountered in the pulp and paper industry are mentioned and some of the ill effects of improper foam control are listed. Emphasis is placed on the many benefits which accrue when some of the newer chemical defoamers are used.

At many points in the pulp and papermaking industry, the operator is constantly fighting foam. The presence of foam and its attendant losses is as much a part of pulp and paper manufacturing as are the other problems of fiber losses and chemical losses. If the industry's operating personnel could have devoted the time used in combating foam in its many forms, to more creative endeavor, the industry might be advanced years over its present stage.

Throughout this paper, the word foam is employed in its general sense, and as such is intended to cover entrained air, froth, and air bubbles, all of which may be encountered by the pulp and paper manufacturer.

Classes of Foam

It has been pointed out *(1)* that chemically pure liquids seldom foam to a high degree. However, in handling fibers in pulp and paper processes, there are always two phases present and usually nonfibrous dissolved or suspended matter is present which tends to stabilize any foam produced.

It is believed that the causes of foam may be fitted into two general categories: (1) mechanical and (2) chemical. Mechanical foam usually results from improper equipment design or, more generally, from operating machines at speeds in excess of the speeds for which they were originally designed. Chemical foam is caused by chemicals used in the process which tend to change surface tension or to produce foam by chemical reaction between products added to the furnish. Troublesome foam in the pulp and paper industry is usually a combination of chemicals *plus* mechanical action. It is believed that in almost all cases, when foam is present, even in small amounts, it interferes with sheet formation and should be eliminated.

In peace-time, the majority of mills who ask for help on foam problems have trouble caused by mechanical design. In war-time, it is often found that the foam is caused by chemicals added; e.g., rosin size, chemicals already present, or because of the use of low grade waste paper. Of the two, mechanical foam is ordinarily easier to control and, in some cases, careful pH control is helpful in eliminating it. However, on chemical foam, one is not always able to materially alter existing pH conditions. Also, in controlling chemical foam, great care usually must be exercised as to the type of foam killer selected as well as the amount necessary to do the job. In some instances a foam killer may upset phase equilibrium to such an extent that when used to control foam on hard sized grades, it partially nullifies the waterproofing imparted by the rosin size.

Foam problems may be further divided in reference to pH conditions of the furnish. Usually, a material which will defoam a stock at a low pH will be relatively ineffective at a high pH. It has also been found that conditions in a soda pulp mill require a different group of products to eliminate foam than when a similar problem arises in a sulphate pulp mill even though pH conditions may be alike. Furthermore, the product which is effective in either place may not prove helpful on the paper machine.

Results of Poor Foam Control

One might ask, why bother to control foam? In answer, consider some of the ill effects foam has on the pulp and papermaking procedure. Many times, foam in the acid towers causes costly delays in the acid making cycle. Foam in the rifflers, screens, and washers may lower the capacity of this equipment. However, the most serious consequences of inadequate foam control occur at the paper machine. The old adage that "an ounce of prevention is worth a pound of cure" was never truer than in this instance. The mill man who neglects to use all of the modern miracles of chemistry for controlling foam which are at his disposal today is failing to make his work as easy as possible. He may also be failing to get the maximum production from his present equipment.

When a machine tender is running a sheet which tends to foam and he does not use or have available an effective defoamer, he may find it necessary to:

1. Run the machine slower.
2. Reduce the volume of water through the fan pump-machine cycle, which in itself may harm formation.
3. Increase the volume and velocity of the cold water spray showers which may be helpful in reducing foam but in turn sends the sheet to the driers at a lower temperature which may mean an increase in steam consumption per ton of product dried.

Consider for a moment what happens to operating costs when it is necessary to slow down a paperboard machine because of foaming conditions. Assume that a machine making white patent coated board is running at 205 feet per minute and produces 7.75 tons per hour. Also, for accounting purposes, assume that this large machine has a burden rate of $90 per hour. At a speed of 205 feet per minute, the burden rate per ton of board produced is $11.61. If it is found necessary to slow down the machine to 200 feet per minute to produce a first quality sheet, the hourly production drops to 7.5 tons per hour. The burden rate immediately goes up to $12 per ton. Considering only one saving, burden rate, it is obvious that if an effective foam killer is available which will enable this machine tender to maintain his speed of 205 feet per minute, that foam killer can be considered as an excellent investment. Actual problems almost exactly

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

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like the above hypothetical case have been solved. The cost of foam killer to accomplish this result usually ranges between 10 and 27c per ton of production.

Since there are so many foam preventives available, how does one go about choosing the right one for a particular foam problem? To the best of the author's knowledge, no one individual or institution has been able to solve all of the foam problems in the pulp and paper industry. This is primarily because of the fact that there are so many operating variables which have a bearing on foam control, that new conditions which require individual study or technique are constantly arising.

As a starting point, a mill might secure 5 gallons, or even a barrel, of a foam killer from some reliable supplier and give it a trial on a mill scale basis. The usual practice is to make a very dilute emulsion using 5 to 10 pounds of defoamer in 50 gallons of water. This serves as a stock emulsion and is dripped into the paper stock at some convenient point; e.g., machine screen, machine headbox, or fan pump. Almost invariably it is the preferred procedure to add a defoamer as close as possible to the point at which the sheet is formed, provided good mixing with the stock is obtained. Foam which occurs in the beater and machine chest is seldom troublesome to the point that it must be controlled. However, there is often enough foam present at these points to partially consume a foam killer which has been added at this point in the stock preparation cycle.

If the above procedure fails to give results, it is suggested that a reliable company which specializes in foam control be called in for consultation and advice. It should always be remembered that the best suppliers of defoamers may not be able to solve the problem except after careful study of all the conditions involved, and may even then fail.

Figure 1 is a recent photograph of a headbox of a fourdrinier making tablet paper at 520 feet per minute. Figure 2 is the same view 20 minutes after adding a well-known foam killer at the fan pump at the rate of 1.9 pounds per ton. Throughout a trial the product should be carefully checked to determine if it really controls the foam without in any way adversely affecting the qualities desired in the sheet being made. The foam killer cost per ton of product produced may be easily calculated during this extended trial period. It should be emphasized that in calculating cost, the foam killer cost per ton of paper or paperboard and not the cost per pound of foam killer

Fig. 1.

Fig. 2.

should be used as a basis of determining cost figures. Many times it has been found that the material which has the highest initial cost, because of its effectiveness, gives the best results and the lowest cost per ton when everything is finally taken into consideration.

Hard sized grades often present a particularly bad foam problem. Not only must a defoaming agent eliminate the froth generated by the rosin size but it must not in any way lessen the water repellency of the finished sheet. To the best of the author's knowledge, only one or possibly two materials are available today which may be added to a hard sized furnish and not only control any foam present but at the same time give more uniform sizing. One mill regularly using a product of this kind on a moderately sized sheet of paperboard experienced a complaint from a customer who found the sheet too water resistant. Investigation proved that an excessive amount of the agent was accidently added, and because of complete elimination of foam, sheet formation was so much improved that more uniform sizing was obtained. This in turn resulted in glueing difficulties in the folding carton plant. This is an unusual case; however it serves to illustrate that the right defoamer is capable of improving sheet formation, if foam is the cause of poor formation.

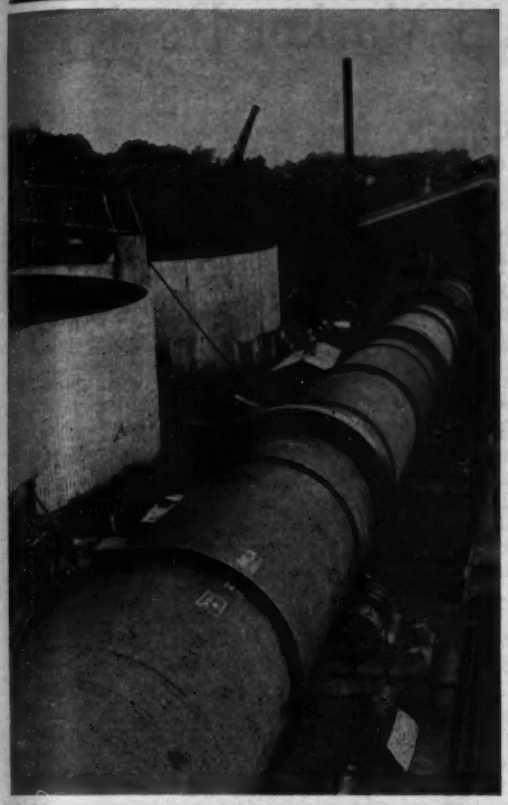
Conclusions

To summarize, the correct foam killer for any job should be:

1. Highly concentrated yet capable of ready dilution into a stock emulsion.
2. Unreactive with other chemicals in the furnish, if such reaction would adversely affect sheet characteristics.
3. Able to improve sheet formation through alteration of flow characteristics of the fiber slurry to permit difficult sheets to be produced, e.g., V-board, at practical machine speed or permit higher machine speed on regular grades.
4. An investment which yields high returns in terms of improved quality and increased production instead of being an added expense in chemical cost of pulp and paper manufacturing.

Literature Cited

1. Lewis, W. K.; Squires, L.; and Broughton, G.; "Industrial Chemistry of Colloidal and Amorphous Materials," 2nd ed., page 266, New York, The Macmillan Company, 1942.



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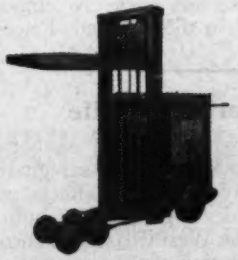

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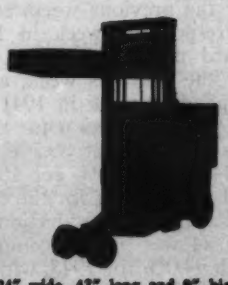

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New York Paper and Pulp Market Review

Opposition Is Voiced At Recommended 5% Cut In Newsprint In Second Quarter — Kraft Pulp Supply Critical — Less Printing, Wrapping and Bag Papers Likely—Waste Paper Salvage Declines.

Office of the PAPER TRADE JOURNAL,
Wednesday, March 7, 1945.

Uncertainty of the supply of paper and paper products for civilian use, and predictions of a tighter supply of paper in the second quarter, adds to the current distribution difficulties in the wholesale paper trade.

Opposition has been voiced of a reduction in newsprint delivery orders of 5% recommended by the Newspaper Industry Advisory Committee in the second quarter. Printing and publishing division officials express fear that the reduction necessary might be greater than 5%, in view of Government requirements. The WPB explained that this recommendation was made in the prospect of an expected newsprint shortage of more than 45,000 tons, approximately 5.25% of estimated orders of 865,000 tons.

The War Production Board's Printing and Publishing Division hopes to prevent a cut in paper consumption quotas for the second quarter of 1945, in spite of a definite reduction in the supply and delivery of paper to the printing industry, J. Hale Steinman, director of the Division, told the Printing and Publishing Labor Advisory Committee at a meeting last week.

Mr. Steinman reported that a survey of newsprint, magazine and commercial paper inventories indicates that it may be possible to continue current consumption for the second quarter in the face of reduced deliveries from the mills. Industry representatives with the larger inventories have expressed a willingness to make this possible by putting a certain amount of their allowable tonnage at the disposal of WPB for the use, if necessary, of publishers with low inventories. The Printing and Publishing Division therefore anticipates a reduction in paper deliveries but possibly no cut in paper consumption quotas for the second quarter. The members of the Labor Advisory Committee unanimously approved this solution.

James Killen, Labor Assistant to the Paper Division, warned that, up to the present time, cuts in paper quotas have been proportionate for all paper consumers, but that hereafter it may be necessary to determine quotas according to the essentiality of the end-product.

The index of general business activity rose to 146.2 for the week ended February 24, from 143.5 for the previous week, compared with 146.7 for the corresponding week in 1944. The index of paper board production was 153.4, compared with 149.8 for the previous week, and with 139.6 for the corresponding week in 1941.

Paper production for the week ended February 24 was estimated at 89.7%, compared with 87.7% for 1944, with 91.0% for 1943, with 104.5% for 1942, and with 88.9% for the corresponding week in 1941.

Paper board production for the week ended February 24 was 93.0%, compared with 93.0% for 1944, with 94.0% for 1943, with 100.0% for 1942 and with 82.0% for the corresponding week in 1941.

A shorter civilian supply in wrapping and some types of converting papers, envelopes, grocery and variety bags and in shipping sacks, is indicated in a late WPB report. Curtailments in other segments of the paper industry will be considered shortly by advisory committees representative of the manufacturers involved, the report stated.

Wood Pulp

Kraft pulp is now a critical material, with most of it being used in fiber shipping containers for overseas shipments, the WPB reports. It is believed that wrapping and bag paper mills will have to take a cut in their pulp allocations in the second quarter. Because of the high essentiality of certain types of industrial and sanitary food container stock, it is hoped that the need for reducing allocations for these paper products may be avoided.

Rags

Mill buying of new cotton cuttings continues active this week. All grades of cuttings are in active demand. Prices are strong at ceiling levels.

Roofing rags are in active demand. The old cotton rag market is in a strong position, as the increasing demand for wipers curtails the supply available to roofing mills. Prices are firm at ceiling levels.

Old Rope and Bagging

Manila rope continues on the urgency list and more of this good fiber is needed by mills. Supply of other fibers is reported as favorable at this date. Prices are firm.

Trading in scrap bagging is reported in fair volume at this date. Buying is characterized as cautious and volume limited. Prices continue nominal.

Old Waste Paper

Mill buying of paper stock continues active with demand in excess of supplies. More waste paper must be salvaged to meet the decreasing available supply of wood pulp for paper production. Collections in January were relatively low at 537,326 tons; consumption, 579,308 tons and, inventories declined to 272,589 tons. The current low inventory position is considered below the safety level by the WPB.

Prices are strong at ceiling levels in all grades of paper stock.

Twine

Demand for twine is reported moderately active in the best available grades this week. No important change has been reported in this market. Prices are firm.

To Safeguard Fish Life

Action by the fisheries department of both the Dominion and Federal Governments to safeguard the fishing industry from any disastrous effects, which might arise through the development of a pulp mill on the Alberni Canal on the West Coast of Vancouver Island, was urged by resolution at the annual meeting of the Kyuoquot Trollers Co-operative at Bamfield, B. C.

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Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

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KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

WAR is Our Preoccupation

(as long as it lasts)

but

Paper Mill Machinery is Our Business

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FROM BEATERS TO CALENDERS

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For all uses requiring an extremely tough non-returnable paper mill core.

4 GRADES

DURO*–Standard returnable core of plus-standard quality. Shown with Taylor ends. Also available with Bermico ends.

ENDURO*–Very high grade returnable core to meet extra demand for strength. Shown with Bermico ends. Taylor ends available.

*Supply limited, due to shortage of higher grade stock from which these cores are made.

BERMICO†—A returnable fibre core—extremely hard, strong and rugged. Treated to resist weather and moisture changes.

†Exclusive distributors for Bermico ends, Bermico Fibre Cores.

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SONOCO MAKES *EVERYTHING* IN *PAPER CARRIERS*

SONOCO PRODUCTS COMPANY

BRANTFORD ONT. HARTSVILLE S. C. MYSTIC CONN.

SHIPPING POINTS: LOWELL, MASS. HARTSVILLE, S. C.

DEPENDABLE SOURCE OF SUPPLY

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, March 7, 1945.

BLANC FIXE—Quotations on blanc fixe continue unchanged. Demand is reported moderate. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand is heavy. Supply situation is reported less favorable at this date. Quotations continue unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Demand continues very heavy. Production and stocks reported higher. Market is tight. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 per 100 pounds; all in drums, car lots, at works.

CHINA CLAY—Quotations on china clay are unchanged. Current demand is reported fair. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with essential requirements met. Production higher in December at 104,339 tons. Stocks slightly larger. Quotations are unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—The rosin market reports ceiling prices on most grades this week. "G" gum rosin is currently quoted at $5.79 per 100 pounds; in barrels, at Savannah. "FF" rosin is currently quoted at $5.75 per 100 pounds, in barrels, at New York. Seventy per cent gum rosin size is currently quoted at $6.06 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake are reported unchanged for the current week. Consumption is reported moderate at this date. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for all-over requirements and market is firm. Production and stocks reported higher. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Current corn receipts decline for lack of freight cars. Prices very firm this week. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA — Demand reported active. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.85 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $21 per ton at mines; Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping...	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag.....	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet....	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.....	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....11.25		@	—
No. 1 Manila Wrapping, 35 lb.....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00
Boards, per ton—			
News *50.00		@	—
Chip *50.00		"	—
Sgl. Mla. Lt. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards...	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1..	$10.55@$12.75	$11.70@$14.25
No. 2..	9.65 " 11.75	10.80 " 13.25
No. 3..	9.20 " 11.25	10.35 " 12.50
No. 4..	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65	@$13.9
No. 2 Glossy Coated...	12.40	" 14.0
No. 3 Glossy Coated...	11.60	" 13.2
No. 4 Glossy Coated...	11.15	" 12.7
No. 1 Antique (watermarked)	10.25	" 11.7
No. 2 Offset	9.60	" 11.0
A Grade E. F.....	9.35	" 10.7
A Grade S. & S. C...	9.60	" 11.0
B Grade E. F.	8.85	" 10.2
B Grade S. C.	9.10	" 10.5
C Grade E. F.	8.55	" 9.7
C Grade S. C.	8.80	" 10.0
D Grade E. F.	8.25	" 9.5
D Grade S. & S. C. ..	8.50	" 9.7

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00
Unbl. Softwood Sulphite.....	74.00
Bl. Hardwood Sulphite.....	83.50
Unbl. Hardwood Sulphite.....	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ..72.00	@ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate...	82.00
S. Semi Bleached Sulphate...	75.00
N. Unbl. Sulphate.....	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Weight Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Weight Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1..	6.50	@ 7.25*
Silesias No. 1.....	—	" 5.75*
New Unbleached...	6.75	" 7.50*
Blue Overall	—	" 5.50*
Fancy	—	" 3.50*
Washables	—	" 3.00*
Bleached Khaki Cuttings	—	" 4.25*
Unbleached Khaki Cuttings	—	" 3.50*

* OPA Maximum Prices.

THE HERMANN CLAFLIN
CONTINUOUS BEATER & REFINER
FOR
ECONOMICAL STOCK PREPARATION

—:—

Numerous installations have proved its ability to improve quality and with a substantial saving in power.

—:—

Adaptable for refining knots and screenings. Continuous and closed systems.

—:—

The Hermann Claflin is built in two sizes at the present time. Large capacity No. 3 ready in near future.

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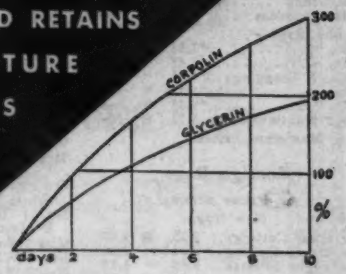
Operated at Conventional Jordan R.P.M.

—:—

THE HERMANN MANUFACTURING CO.
Also Mfg's. Sheet Making-Pulp Testing Apparatus
LANCASTER, OHIO

CORPOLIN*
ATTRACTS AND RETAINS MORE MOISTURE THAN DOES ANY OTHER LIQUID



Moisture Attraction at 100% Rel. Hum. and 27° C.

*Patent Pending. Name Reg. U. S. Pat. Off.

CHARACTERISTICS: Colorless, heavy, odorless liquid; non-volatile, non-toxic. Resembles glycerin in appearance and feel.

USES: for plasticising any kind of paper for any use.

AVAILABLE in any quantity without priority.

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Copper, Bronze, Steel, Stainless Steel and other metals, Heat-treated.
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THE CORROSION RESISTANT ALLOY
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for all equipment exposed to corrosion by sulphite acids
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LAMINATED PAPERS

HAVE you planned for the unusual demand for this type of product after the war? • Ask about machines for laminating foil, paper, glassine, cellophane and boards. • We build them for pastes, glues, asphalts and waxes. • Can we send complete information? Ask us.

•

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

Old Rags

White, No. 1—		
Repacked	*1.80	—
Miscellaneous	*1.20	—
White, No. 2—		
Repacked	*2.90	—
Miscellaneous	*2.65	—
Third and Blues—		
Repacked	*2.20	—
Miscellaneous	*1.80	—
Roofing Rags—		
No. 1	*1.55	—
No. 2	*1.45	—
No. 3 (bagging)	*1.35	—
No. 4	*1.25	—
No. 5A	*1.35	—
Old Manila Rope	5.75	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	2.40
New Mixed Cuttings	2.00	2.20
New Light Silesias	5.50	5.75
Light Flannelettes	5.50	5.75
New White Cuttings	7.00	7.50
New Light Oxfords	4.00	4.50
New Light Prints	3.00	3.25

Old Rags

No. 1 White Linens	7.50	8.50
No. 2 White Linens	6.50	7.50
No. 3 White Linens	4.50	—
No. 4 White Linens	2.25	3.25
No. 1 White Cotton	4.25	4.75
No. 2 White Cotton	3.25	3.75
No. 3 White Cotton	2.50	3.00
No. 4 White Cotton	1.90	2.20
Extra Light Prints	2.00	2.40
Ord. Light Prints	1.75	2.15
Med. Light Prints	1.55	1.95
Dutch Blue Cottons	2.25	2.50
French Blue Linens	3.00	—
Checks and Blues	2.00	—
Linsey Garments	1.90	2.00
Dark Cottons	1.50	1.60
Old Shopperies	1.30	1.45
New Shopperies	1.45	1.50
French Blues	2.25	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—		
Foreign	Nominal	
Domestic	4.25	4.35
Wool Tares, light	4.25	4.50
Wool Tares heavy	4.50	5.00
Bright Bagging	4.50	4.85
Manila Rope—		
Foreign	—	—
Domestic	*3.75	—
Jute Threads	5.50	—
No. 1 Sisal Strings	*4.00	—
Mixed Strings	2.00	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Envelope Cuts	3.12½	—
No. 1 Hard White Shavings, ruled	2.50	—
Soft White Shavings, one cut	2.87½	—
No. 1 Soft White Shavings	2.50	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
Mixed Groundwood Colored Shavings	.90	—
Overissue Magazines	1.67½	—
No. 1 Heavy Books & Magazines	1.92½	—
Mixed Books	1.10	—
No. 1 White Ledger	2.30	—
No. 2 Mixed Ledger, colored	2.00	—
New Manila Envelope Cuttings, one cut	2.87½	—
New Manila Envelope Cuttings	2.65	—
Extra Manilas	1.95	—
Mixed Kraft, Env. & Bag Cuttings	2.75	—
Kraft Envelope Cuttings	3.25	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	—
New 100% Kraft Corrugated Cuttings	2.25	—
No. 1 Assorted Old Kraft	1.75	—
New Jute Corrugated Cuttings	.90	—
Old 100% Kraft Corrugated Containers	1.75	—
Old Corrugated Containers	1.40	—
Box Board Cuttings	.72½	—
White Blank News	1.65	—
Overissue News	1.10	—
No. 1 News	1.00	—
No. 1 Mixed Paper	.95	—
Old Corrugated Containers	.82½	—
Mill Wrappers	1.10	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—		
India	.21	—
White Hemp	.21	—
Fine Polished—		
Fine India	.36	—
Unpolished—		
Box	.17½	—
Paper Makers	.17	—
Tube Rope	.1[illegible]	—
Wall Paper	.20½	—
Wrapping	.23	—
Soft Fiber Rope	.19	—
Cotton	.25	—

(Hard Fiber)

Medium Java	.12	—
Mex. Sisal	.16	—
Manila	—	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07½
New White No. 2	.05½
Light Silesias	.05½
Black Silesias, soft	.03½
New Unbleached	.07½
Washable Prints	.04½
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01½
Fancy Percales	.04½
New Black Soft	.03½
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04½
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03½

Domestic Rags (Old)

White No. 1—Repacked	3.80	—
Miscellaneous No. 1	3.30	—
Miscellaneous No. 2	2.65	—
White No. 2—Repacked	2.90	—
Thirds and Blues—		
Miscellaneous	1.80	—
Repacked	2.20	—
Black Stockings—		
(Export)	Nominal	
Roofing Stock—		
Foreign No. 1	Nominal	
Domestic No. 1	1.55	—
Domestic No. 2	1.45	—
Roofing Bagging	1.35	—
Old Manila Rope	5.75	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—		
Foreign	Nominal	
Domestic	3.00	3.50
No. 1 Clean bright—Sisal Srings		.04
No. 2 Clean bright—Sisal Strings		.03
Sisal Jute	.02½	.02¾
Scrap—		
No. 1	3.25	3.30
No. 2	1.75	1.80
Wool Tares, heavy	4.00	4.25
No. 1 New Light Burlap	3.90	4.00
New Burlap Cuttings	3.75	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Shavings, unruled	2.87½	—
Soft White Shavings, one cut	2.50	—
White Blank News	1.65	—
Soft White Shavings, Misc.	2.15	—
No. 1 Mixed Paper	.95	—
Box Board Cuttings	.72½	—
Kraft Corrugated Cuttings	2.25	—
Old Corrugated Containers	1.40	—
Overissue News	1.00	—
No. 1 News	1.00	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Hard White Shavings, ruled	2.50	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
New Manila Envelope Cuts, one cut	2.87½	—
Hard White Envelope Cuts, one cut	3.37½	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	—
Mixed Kraft Env. & Bag Cuttings	2.75	—
Kraft Envelope Cuttings	3.25	—
No. 1 Heavy Books & Magazines	1.92½	—
New Manila Envelope Cuts, one cut	2.87½	—
New Manila Envelope Cuttings	2.65	—
White and Colored Tabulating Cards	2.25	—
Ground Wood Tabulating Cards	1.35	—
White Blank News	1.65	—
No. 1 Assorted Old Kraft	1.75	—
No. 1 Mixed Paper	.95	—
Overissue News	1.10	—
Box Board Cuttings	.72½	—
New Corrugated Cuttings, Kraft	2.25	—
Old 100% Kraft Corrugated Containers	1.75	—
Old Corrugated Containers	1.40	—
Jute Corrugated Cuttings	1.07½	—

Bagging

(F. o. b. Boston)

Gunny Bagging—		
Foreign	(nominal)	
Domestic	—	2.50
Sisal Rope No. 1	*4.75	—
Sisal Rope No. 2	*4.25	—
Mixed Rope	—	1.55
Transmission Rope—		
Foreign	(nominal)	
Domestic	2.75	3.00
Manila Rope—		
Foreign	(nominal)	
Domestic	5.75	—
Soft Jute Rope	5.25	—
Jute Car Wheads	3.00	3.50
Bleachery Burlap	8.50	9.00
Scrap Burlap—		
Foreign	(nominal)	
Domestic	—	2.75
South American	—	3.00
Wool Tares—		
Foreign	(nominal)	
Domestic	4.25	—
Aust. Wool Pouches	—	3.90
New Zealand Wool Pouches	—	2.50
New Burlap Cuttings	4.75	5.00
Heavy Baling Bagging	4.00	4.25
Paper Mill Bagging	2.50	3.00
No. 2 Roofing Bagging	1.35	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—	
New Light Prints	.04½
Fancy Percales	.04¼
New White No 1.	.06¼
New Light Flannelettes	.03½
Canton Flannels, Bleached	.06
Underwear Cutters, Bleached	.06¼
Underwear Cutters, Unbleached	.05¼
Silesias No. 1	.06
New Black Silesias	.03
Red Cotton Cuttings	.03½
Soft Unbleached Blue Cheviots	.06½
Fancy	.02¼
Washable	.02¼
Khaki Cuttings	.02¼
O. D. Khaki	.03½
Corduroy	.03¼
New Canvas	.06¼
B. V. D. Cuttings	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—		
Repacked	3.80	—
Miscellaneous	3.20	—
White No. 2—		
Miscellaneous	2.65	—
Twos and Blues, Repacked	2.20	—
Old Blue Overalls	2.25	2.30
Thirds and Blues, Repacked	2.20	—
Miscellaneous	1.80	—
Black Stockings	3.50	4.00
Roofing Stock—		
No. 1	1.55	—
No. 2	1.45	—
No. 3	1.35	—
No. 4	1.35	—
No. 5, Quality A	1.35	—
Quality B	1.20	—
Quality C	.95	—
Old Manila Rope	5.75	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—		
No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Soft White Shavings	2.50	—
No. 1 White Ledger	2.30	—
No. 1 Heavy Books & Magazines	1.92½	—
White Blank News	1.65	—
Mixed Kraft Env. & Bag Cuttings	2.75	—
No. 1 Assorted Old Kraft	1.75	—
Overissue News	1.10	—
No. 1 News	1.00	—
No. 1 Mixed Paper	.95	—
No. 1 Roofing Rags	1.35	—
No. 1 Roofing Bags	1.45	—

IMPROVED INK RESISTANCE
of Printing Papers

PQ silicate, by chemical reaction with alum in the beater, produces a sheet of high ink resistance. Mill superintendents agree that the elimination of fuzz on the silicated paper is an important factor in the creation of proper ink resistance.

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BLACKS

Unexcelled carbon black pigments for all types of paper and board stocks.

Outstanding for soft texture, particle fineness, and jet black color.

Best for performance in the Beater and Jordan because of ease of wetting and ready dispersion in the pulp.

Takes well to the fiber and shows high retention.

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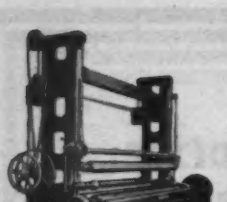

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STEAM TURBINES
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Paper Bag Machines, Aniline & Oil-Ink Presses, Waxing, Gluing, Varnishing, Laminating Machines.

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the modern means for

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Prepare NOW to Take Care of Increased Orders Which Will Come. Consider Necessary Repairs and Maintenance.

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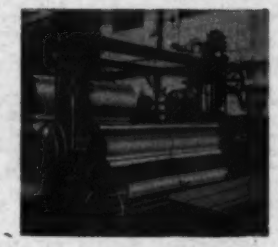
Has design features found in wider and faster Camachines. Built in widths up to 92". Runs at speeds up to 1,400 F.P.M.



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Worn Rollers Re-Engraved.

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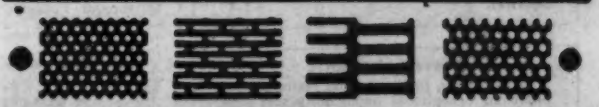

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(Folding Cartons)

An unusually attractive position is offered by a large, middle-west carton company. The man we want must be a thorough executive with a complete background of all phases of manufacture and an excellent record of achievement. He will take full charge of planning and production. Remuneration will be in five figures, including a profit-sharing bonus.

EMPIRE BOX CORPORATION
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M-22

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Specializing in Paper Mill Personnel

Positions Now Open

Manager for fine paper mill
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Chemists (several)
Mechanical and designing engineers, mechanical draftsmen, plant engineers, master mechanics
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Salesman for folding cartons
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Machine tenders, back tenders and beater engineers, etc. for mills in the United States and Canada

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Chemical manufacturer has opening for a man with broad experience in the pulp and paper industry and preferably with graduate training in chemistry. Experience in the paper converting, synthetic resins or plastics fields would be helpful. Excellent opportunity for a man capable of conducting and supervising important development work.

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ENGINEERS and DRAFTSMEN experienced in pulp and paper mill design and process by Consulting Engineers. Address Box 45-146 care Paper Trade Journal. T.F.

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A large eastern folding carton manufacturer offers an exceptional opportunity for present and future advancement to a man qualified to take complete charge of its maintenance work. Because of post-war future, involving large expansion program, we believe that this position offers greatest compensation.

EMPIRE BOX CORPORATION
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M-22

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HELP WANTED
Backtenders
Machine Tenders
Beater Men
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Good wages, cheap board, good comfortable apartments free of charge. Wire collect or phone

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Lancaster 2-0016 M-8

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ENGINEER—Excellent opportunity in essential industry for a young man with research ability. Ch. E. or M. E. preferred. Permanent responsible position with reliable progressive textile firm. State age, training, experience. Include photo. Address Box 45-96 care Paper Trade Journal. M-8

WANTED — MILL MANAGER WITH EXPERIENCE IN HANDLING PULP AND FINE PAPER OPERATIONS. TECHNICAL EDUCATION PREFERRED. APPLY BOX 45-118 CARE PAPER TRADE JOURNAL. M8

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SALESMAN—With paper maker or paper chemistry background. Splendid opportunity with alert organization for man with initiative. Give all details in reply to Box 45-139 care Paper Trade Journal. M-29

WANTED—FOREMAN and Operator for web style printing operation in Bag Plant. Experience on Potdewn press desirable but other web style experience acceptable. Pittsburgh, Penna. area. Address Box 45-127 care Peper Trade Journal. M-8

WANTED — PAPER MILL CHEMIST for middle west combined paperboard mill, carton and container plant; laboratory research and development. Address Box 45-141 care Paper Trade Journal. M-22

WANTED man 30-40 years old with paper mill experience for permanent sales-service work with manufacturer of colloidal material for paper size. Our employees know of this advertisement. Address Box 45-149 care Paper Trade Journal. M-8

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PAPER MILL SUPERINTENDENT seeks change. Experienced on Tissues, Kraft Bag, Kraft and Sulphite Waxing, Bonds, all creping grades. Address Box 45-99 care Paper Trade Journal. M-8

PRODUCTION MAN—Thoroughly experienced in production and supervision all varieties fine cardboards. Successful record personnel relations. Address Box 45-4 care Paper Trade Journal. M-8

SUPERINTENDENT—Experienced, Self Opening, Squares, Flats, Sacks, Specialties. To take full charge of Bag Plant. Give full data. Address Box 45-126 care Paper Trade Journal. M-8

MECHANICAL ENGINEER—Over 20 years' experience in pulp, paper and board mills in both the kraft and sulphite processes. Thoroughly versed in all phases of engineering, power and operation. Very capable of supervising and handling men. Have held positions as Chief Engineer, Plant Engineer and in managing capacity. Able to take over on short notice. Invites correspondence. Address Box 45-111 care Paper Trade Journal. M-15

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CHEMIST—Ph. D., Mass. Inst. Tech. Broad Research, development and executive experience. Sulfite pulping, tissues, absorbent papers, coated papers and adhesives. Member TAPPI. Address Box 45-107 care Paper Trade Journal. M-8

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Medicine Saved a Mighty Oak

Yes—but experts had to apply the remedy in time, for time was important.

Nor is an inanimate thing like a paper machine any different. Replace battered bearings, correct roll crowns, balance rolls, realign rolls, etc. Check your doctors, draws between sections, check your lubrication. Check everything.

Do these things in time, otherwise the entire machine rapidly deteriorates and, like the neglected oak that falls years too soon, has to be replaced in its entirety and at a greater cost.

Black-Clawson engineers can suggest the "medicine" that will add years to the life of your machine — point out ways to spend dimes today to avoid spending dollars tomorrow.
Give them that opportunity.

SHARTLE Dilts

THE BLACK-CLAWSON CO., Hamilton, Ohio
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FOR SALE

1—#1 Nash vacuum pump
2—12 x 12 Gould triplex stuff pumps
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2—Herne iron tub beaters
1—Holyoke beater
2—Horizontal wood chests and agitators about 8' diameter x 13' long
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SHARTLE BROTHERS MACHINE COMPANY
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M-22

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1—Complete 98" Fourdrinier Paper Machine with 26 Dryers, 48" diameter x 96" face, including auxiliary equipment. Additional details on request.

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Telephone Bigelow 3-3720 F-22

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FOR SALE

2—#5 Bird Save-alls.
1—Trimbey Centrifugal Pulp Screen.
1—120" Fourdrinier Wet End.
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Various sizes of Centrifugal Pumps. Write us regarding your particular requirements.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

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Bigelow 3-3720 M-8

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1—44" Waldron Drum Reeling and Rewinding Machine.
1—Pusey & Jones 5" x 8" open impeller Centrifugal Stock Pumps, Belt driven.
4—14" x 20" Connersville Vacuum Pumps.
3—12" x 18" Connersville Vacuum Pumps.
These pumps are fully rebuilt.
5—New Fourdriniers, wires 75 mesh, 75" wide by 50 foot long. Now in original boxes.
1—Downingtown 2500 lb. iron tub cyclone beater. Beater roll 60" face, 72" diameter. This beater in excellent condition having been in operation less than two years. Prints on request.

M-8

FOR SALE

1—Hydraulic Press with frames, capable of handling shafts 15 ft. long
1—No. 17 Foote-Burt three spindle drill
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1—75 KVA gasoline engine, portable generator set
1—Small 9 KVA unit

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M-15

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4—Cylinder molds 66 x 169 with vats and rubber covered couchers. Anti-friction bearings can cut down.

Box No. 45-125 care Paper Trade Journal.
M-8

FOR SALE

New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
S-6

FOR SALE

1—Holyoke Machine Co., 9 roll, 44" finishing calender stack.

Brass lined journals—hand wheel and screw adjustment. Double flanged drive wheel. Unwinding and rewinding shaft. Two spare rolls.

General Electric Co., 50 h.p., slip ring induction motor. Predetermined speed panel. Rheostat and controller. 7½ h.p. threader motor, induction type.

Address Box 45-142 care Paper Trade Journal. M-15

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2—Vickery felt conditioners with 2 vacuum boxes each suitable for 128 rolls. Can Cut down.

SHARTLE BROS. MACHINE CO.
Middletown, Ohio M-15

FOR SALE

1—9-roll 88" calender stack
1—11-roll 104" calender stack
1—jordan with 49" plug

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Middletown, Ohio
M-15

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PAPER MILL EQUIPMENT FOR SALE

65" Clark Sheeter with Erie Layboy and 16 roll backstand.
110" Hamblet Sheeter with 3 slitters and 4-roll backstand.
45" White Automatic Power Cutter.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machine.
63" Oswego Mill Type Cutter.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
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FOR SALE

45" Standard Beck Rotary Sheet Cutter.
62" Moore & White Rotary Sheet Cutter.
1—Noble & Wood Mammoth Jordan with new shell and plug fillings.
1—Standard Horse Jordan with extra shell and plug fillings.
1—Oliver Filter, 9' long, 11'-6" diameter.
5—Double-drum Warren Winders, 62", 103" and 104" wide.
1—Double-drum Bagley & Sewall Winder, 140" wide.
1—62" Sheridan Power Paper Cutter.
1—80" Standard Power Paper Cutter.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
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FOR SALE

1—Evaporator, 50 ton, made by Bethlehem Steel.

SHARTLE BROS. MACHINE CO.
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M-15

FOR SALE — NEW #2 LANNOYE PULPER. ADDRESS BOX 45-113 CARE PAPER TRADE JOURNAL. M-15

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

FOR SALE—Meisel spot sheeter and layboy 48". American Decalcomania Co., 4334 West Fifth Avenue, Chicago, 24, Ill. M-8

FOR SALE—CLAFIN REFINER, belt driven 30" dia. grinding plates. Write for further details. Address Box 45-94 care Paper Trade Journal. M-8

FOR SALE—120" Moore & White four-drum Rewinder; 50" and 65" Slitters. Address Box 45-151 care Paper Trade Journal. M-15

MACHINERY WANTED

By JACK ROSS 17 Porter Avenue, Newark, 8 N. J.

Waverly 3-5675

Cash purchaser of all types of paper, pulp and converting equipment.
From single items to complete plants.
Write, telephone or wire whatever you have for sale.

FOR SALE

FOR SALE—ONE 70 INCH WALDRON COATER IN GOOD CONDITION. ADDITIONAL INFORMATION FURNISHED UPON REQUEST. Address Box 45-124 care Paper Trade Journal. M-8

FOR SALE—Valley Iron Works 100 lb. Batch Beater; 2-Rosback 42" Confetti Machines. DRILL EQUIPMENT COMPANY, 225 W. 34th Street, New York, 1, N. Y. M-8

FOR SALE—Complete Paper Tube Plant, 2 Langston Spiral Winders, 1 heavy duty winder for Paper Cores; Tube recutters and tools, mandrels, etc. Paperboard slitter, Paper Cap Punch Press and Dies. Reasonable for quick sale. THEO. ADAMS, 111 W. Washington Street, Chicago, 2, Illinois. M-8

FOR SALE—1-Oliver United American Continuous Vacuum Filter, right hand, 8'-6" diameter, 6 disc bronze sectors covered with 5 mesh bronze backing wire; two extra bronze sectors arranged for direct connected motor drive. Address Box 45-129 care Paper Trade Journal. M-8

FOR SALE—Complete Creping Machine three cylinders 60" diameter x 86" face with drive. Address Box 45-140 care Paper Trade Journal. M-15

FOR SALE—Waxing Machine, approximately 30 inches wide. Will wax wet wax and dry wax. $1000. Address Box 45-147 care Paper Trade Journal. M-8

FOR SALE—64" Seybold Twentieth Century Cutter, guaranteed to be in good working order. Address Box 45-152 care Paper Trade Journal. M-8

WANTED

WANTED

CALENDER STOCK—10" INTERMEDIATE ROLL MINIMUM
ALSO
SHEETER—SINGLE OR DOUBLE CUT-OFF BOTH FOR 72" MACHINE

Address Box 44-728 care Paper Trade Journal. TF

WANTED

One (1) Laboratory Beater
Waterbury Hydraulic Drive size 5
1—60" Diameter x 92" Face Dryers
16—48" Diameter x 92" Face Dryers
4—30" Diameter x 92" Face Dryers

with gears, frames, felt rolls and cone pulley drives. Address Box 44-708 care Paper Trade Journal. TF

WANTED—Any Item of Paper Tube and Paper Can Machinery, Slitters, Tube Winders, Cutters, etc. etc. We will buy such machinery in any condition. Theo. Adams, 111 W. Washington St., Chicago, 2, Ill. TF

WANTED — Second-hand spiral tube-making machine suitable for toilet paper tubes, complete with automatic cutting-off device if available. Address Fort Howard Paper Company, Green Bay, Wis. M-8

WANTED TO BUY—Power Paper Baler for 300 to 400 pound bales. Address Box 45-145 care Paper Trde Journl. M-8

WANTED

WANTED

One Beater of 1,000 lb. capacity. Give complete description, specifications and price.

FOR SALE

42 Dryers consisting of 85" and 86" face—36" diameter, complete with triple deck stands, gears, bearings and piping.

EMPIRE BOX CORPORATION
Garfield, New Jersey

TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal tf

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED—Mill roll shaft for Cameron type 6 slitter 1¼" diameter; 84 inches long or nearest substitute. Standard Bag Company, 65 Duane Street, New York. (WOrth 2-3296.) M-8

INDIVIDUAL interested in the purchase of small folding carton plant. Replies confidential. Address Box 45-134 care Paper Trade Journal. M-29

WANTED TO BUY—Seybold or other good cutter 48 to 50 inches. Must be in good condition. Address Box 45-143 care Paper Trade Journal. M-8

WANTED TO BUY—Paper Shredder to shred paper from rolls. Address Box 45-144 care Paper Trade Journal. M-8

WE ARE INTERESTED IN BUYING a Rewinder and Slitter—72" or wider. Equipment must handle large Jumbo rolls and rewind and slit to various small size counter rolls in 9" diameter. Address Box 45-137 care Paper Trade Journal. M-8

GOVERNMENT BIDS

PROPOSALS

FOR FURNISHING

PAPER FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a. m., March 12, 1945, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper for the use of the Government departments and establishments in the District of Columbia, for the term of three months, beginning April 1, 1945; deliveries to be f. o. b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposal. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedules, and specifications may be obtained by addressing A. E. Giegengack, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the instructions.

The approximate estimated quantities set forth in detail in the schedule comprise:

PAPER

1,500,000 pounds newsprint paper; 150,000 pounds telephone book news; 1,880,000 pounds machine-finish book paper; 3,500,000 pounds offset book paper; 110,000 pounds lightweight machine-finish book paper; 40,000 pounds 50% antique book paper; 1,300,000 pounds supercalendered book paper; 3,800,000 pounds machine-coated book paper; 400,000 pounds coated book; 3,200,000 pounds mimeograph paper; 500,000 pounds duplicator copy paper; 100,000 pounds U S M O safety writing paper; 15,450,000 pounds writing paper; 1,257,000 pounds map paper; 715,000 pounds manifold paper; 2,500,000 pounds bond paper; 1,440,000 pounds ledger paper; 1,980,000 pounds index paper; 290,000 pounds cover paper; 40,000 sheets cloth-lined cover; 180,000 pounds manila paper; 300,000 pounds kraft paper; 600,000 sheets white gummed paper; 40,000 pounds blotting paper; 40,000 pounds manila tag board; 530,000 pounds calendered tag board; 180,000 sheets railroad board; 200,000 pounds tan bristol board; 540,000 pounds wood bristol; 3,600,000 pounds postal card bristol; 500,000 pounds news board; 470,000 pounds binder's board; 40,000 pounds chestnut cover board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

By direction of the Joint Committee on Printing.

A. E. GIEGENGACK,
Public Printer.

WASHINGTON, D. C.,
February 27, 1945. M-8

CLASSIFIED ADS BRING RESULTS

WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BAG MACHINES
Thomas W. Hall Co., Inc.
Pendevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Rollway Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company
Valley Iron Works Co.

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.

CALENDERS
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Aktivin Corporation
Amer. Cyanamid & Chem. Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali o.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
The Neville Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Oakite Products, Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
W. R. Cliffe
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
L. I. M. E.
Merritt-Chapman & Scott Corp.
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elixman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plahn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Mfg. Co.
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGHSTERS
The Biggs Boiler Works Co.
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric & Manufacturing Company

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric & Manufacturing Company

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Pitchburg Duck Mills
Huyck & Son, F. C.
Leckport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
International Pulp Co.
W. H. Loomis Talc Corp.
Union Talc Co.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Kemp, W. P., Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Robinson, C. P.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Covel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
H. P. Bowsher
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.
Westinghouse Electric & Manufacturing Company
Wilkens-Anderson Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
Tide Water Associated Oil Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric & Manufacturing Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
The Norwood Engineering Company
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
Klemp, W. F., Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
The Richardson Economy Plug Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gotteaman & Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
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RESINS
American Cyanamid & Chemical Corp.
The Neville Company
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
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The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

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Carthage Machine Co.

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Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

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Black-Clawson Company
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Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

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American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

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Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
The Stanley Works

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E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
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Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric & Manufacturing Company.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
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E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
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Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

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Ingersoll-Rand Co.
The Stanley Works
Walworth Company

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Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
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Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

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De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric & Manufacturing Company
Worthington Pump & Machinery Corp.

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Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
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Dilts Machine Works
The Foxboro Company
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Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
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Union Screen Plate Co.

WASHERS
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Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric & Manufacturing Company

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
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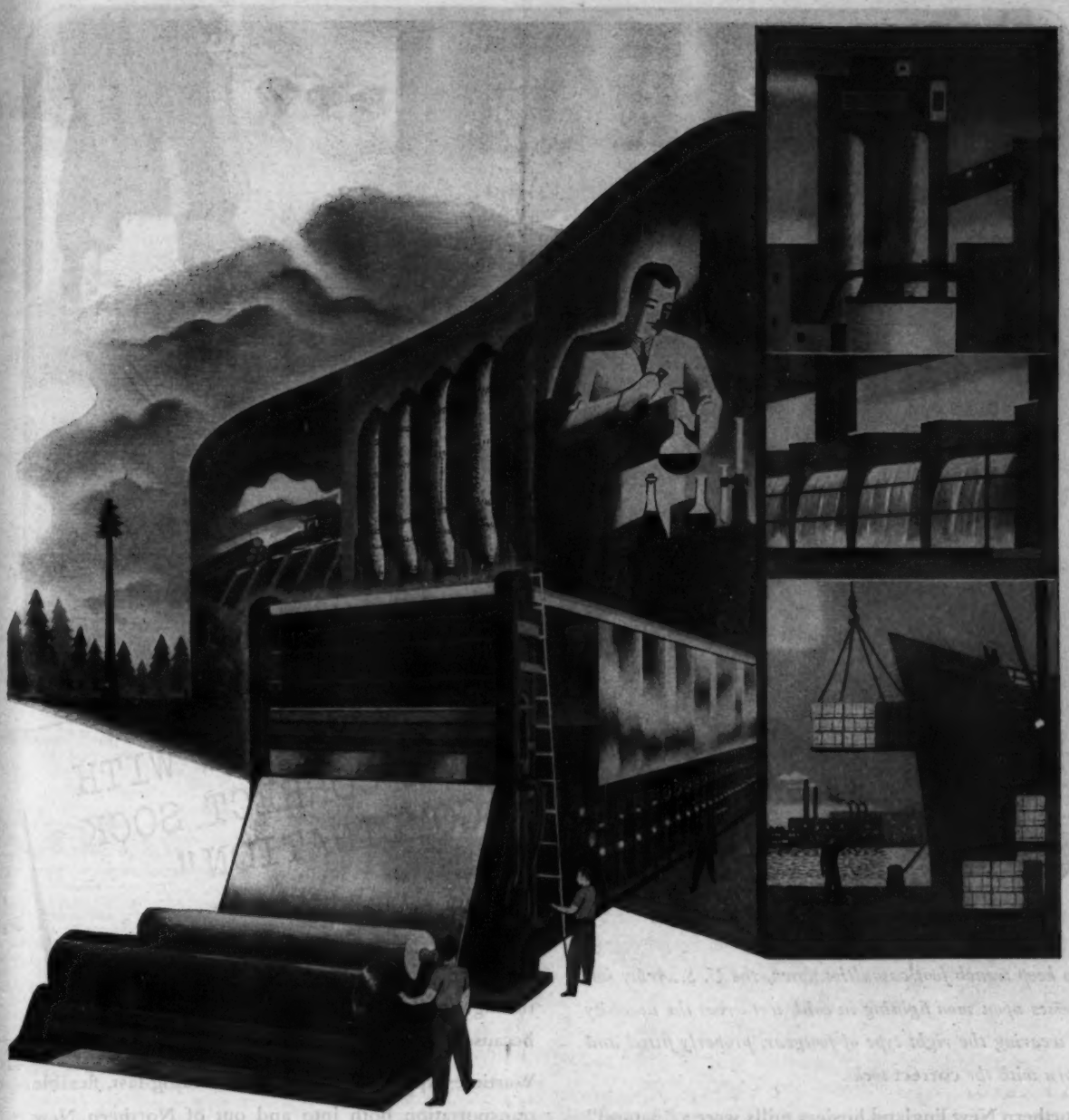

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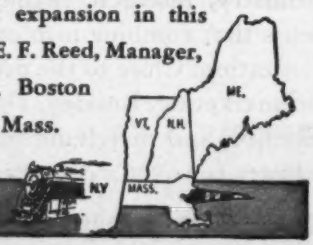

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